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**The Comprehensive Examinations at the University
of Minnesota***

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Minneapolis, Minnesota

I understand that this symposium is concerned with the presentation of the methods of examinations used at certain schools, and that the general theory of such tests, if it comes up at all, will be through discussion afterward. Therefore, I shall confine this paper to the matter of method, merely remarking that our faculty became dissatisfied with the prevailing system of quarterly examinations and course marks about three years ago, and adopted the present system as a corrective thereof. Of course, the evils of frequent examinations are aggravated under the quarter system as contrasted with the semester system.

As to the phrase "comprehensive examination," it has widely varying degrees of extension as used by different people and by different institutions. In the papers set by the Pennsylvania survey, and used more or less in Arts colleges, questions may range the whole domain of human knowledge—all the way from astronomy to zoology, from Alaska to Zanzibar, from any-old-name to Zeno, Zoroaster or Zapffe! The questions in the new University of Chicago "College" are set within the broad boundaries of their four divisions, Biological Science, Physical Science, Social Science and Humanities. But this, again, allows a very wide range.¹

It must be confessed that our Minnesota examinations up to this time are not comprehensive in this sense. They are confined to departmental subject matter, set and read by departmental examiners and recorded as covering departmental requirements. Our students, therefore, speak of them as "deferred finals." However, our examinations comprise a whole year's work. They are "passed" or "failed" as a whole. The courses of a

*Presented at the Forty-third Annual Meeting of the Association of American Medical Colleges held in Philadelphia, November 14-16, 1932.

1. I recommend that each medical school secure and have on file the pamphlet containing these Chicago examinations as given in June, 1932. This publication may be obtained from the University of Chicago Bookstore; price, 50 cents. This pamphlet is illuminating and suggestive. It is to be noted that Chicago has founded a Board of Examiners composed of teachers whose large duty it is to study and formulate examinations and who are given ample time for this task.

single department are covered by one paper, and are thus, to a certain extent, integrated. The questions set are scrutinized by representatives of other departments. The whole examination is under central control. The results are formulated and confirmed by committees, i.e. interdepartmental action. Therefore, I think the adjective "comprehensive" is fairly justified though it is regrettable, it seems to me, that examiners have so far refused to cross departmental boundaries and set questions involving several aspects of the same subject. The pathologist, for example, says he does not know enough to set and read a question involving the anatomy, physiology or pharmacology of the kidney, although he passed courses in these subjects when he was a student. We have therefore the *reductio ad absurdum* of requiring the student to know more than the instructor.

Surely this is not too strong an indictment. It is a lamentable fact that each department loads the student with a mass of detail which he cannot retain. It is to be feared that in this process the student loses sight of the essential facts and generalizations he will need later. With this explanation I will describe our system.

THE MINNESOTA SYSTEM

We have four examinations covering respectively the required work of the freshman, sophomore, junior and senior years.² These examinations, except for seniors, are offered twice yearly, in June and in September. Seniors are examined at the end of any quarter in which they complete the curriculum.

Chief Examiner—All examinations are under jurisdiction of a chief examiner, who attends to all mimeographing, provides examination books, arranges the examination room and supervises, with the aid of proctors supplied by departments on request, the actual conduct of the tests. He is chairman of the respective examining committees, keeps the records and sends the final marks to the registrar.

Our chief examiner is Dr. Rasmussen of the Department of Anatomy who is noted among us for the care with which he arranges all details and his constant effort to make the examinations absolutely fair in every way. We are fortunate in having in charge a person who takes the examiner function seriously. Too many American faculty men, while they give ample time and effort to teaching, are inclined to slight the perhaps equally important function of examinations, and which is stressed much more in European schools.

Admission to Examinations.—Only students who are "eligible" in all the required courses of a given year are admitted to a comprehensive ex-

2. Examination in a few courses is deferred until the year after that in which the subject appears in the curriculum. For example there is a lecture course in Principles of Surgery in the last quarter of the sophomore year. Examination on this subject is deferred and combined with other surgery courses of the junior year.

amination. To be eligible in a course a student must have completed the work of that course to the satisfaction of the department concerned. Departments keep such records and institute such tests as they individually see fit to determine eligibility. A student declared "ineligible" in a course must repeat that course. Meanwhile, he may not take the comprehensive examination.

Examining Committees.—For each year's work there is an examining committee composed of representatives of departments concerned. Each committee meets before an examination and goes over the papers prepared by respective departments. This function is taken seriously. They go into such matters as the appropriateness of questions, the clarity of statement, the time likely to be required, and so on. The result of this previous scrutiny has been to improve the character of our examination questions in all respects.

After the examinations the papers of students are read and graded by the respective departments. The resulting marks are collected and tabulated by the chief examiner, after which each committee meets again. The chief examiner presents the results attained by each student by number only. All who have a "C" average and no failures are passed *pro forma*. The distinct failures are usually decided without much comment. But great care is devoted to borderline cases. The examiners have been informed about such cases by the chief examiner previous to the meeting and bring with them the papers and all additional data needed. Papers are reread and marks changed as circumstances indicate. Finally, vote of the committee settles each case. The previous record of the student is not available nor are names of students known to such a committee. The matter is absolutely impersonal. Some complain that this attitude is sometimes unfair. But the present temper of the faculty is that the consideration of personal factors introduces greater unfairness.

In general the "all or none" principle is used—that is, a student must pass in all subjects and have a "C" average on the whole. But the committees have full power; and, particularly by the upper class committees, it may be voted to permit a later reexamination on a single subject, with or without privilege of going on with advanced courses meanwhile.

Mechanism of Examinations.—Dr. Rasmussen has devoted great effort to establish a model mechanism of examinations. The field house is used. Tables are set up giving each student a four foot space. Classes are seated in alternate order, so that a student is not near a class mate. The aisles are wide. Cheating by intercommunication is practically ruled out. No extraneous papers are permitted. The cover colors of examination books are frequently changed. Proctors are moving about in various parts of the room. If anyone has used personal "ponies" no one has so far been

detected. One of our examinations, with 500 students writing at once, is a picture of orderly efficiency.

Quite irrespective of the comprehensive idea, the central supervision of examinations is well worth adoption. Cheating is a contagious disease. Most students prefer not to cheat but are driven to it when the supervision is so weak that class mates can do it and "get away with it." This was formerly the case under uncertain methods of departmental jurisdiction—a single instructor, perhaps, sitting down in front reading a newspaper and students of one class seated elbow to elbow in an ordinary lecture room.

I should, perhaps, add that these remarks have no application in places where the honor system is in operation. With our students there is no disposition to adopt that system. There is no sentiment for assuming such responsibility on the part of the student body. It goes without saying that I wish such sentiment existed but it does not.

Records.—The marks of students declared by respective committees to have passed, are reported to the registrar and recorded for the various courses set down in the curriculum. For example, the junior work in medicine is composed of five courses described in the Bulletin. A single examination covers these courses. The grade a student makes on this examination is recorded for each of the courses composing the sequence. This permits the computation of the relative standing of students in their classes by the point system in the usual way. The registrar's record of "failed" students is merely "failed comprehensive," with the date. No marks on particular courses are sent to the registrar for failed students.

Transfer of Students.—For the student who passes, the transfer to another school presents only the usual difficulty. For the student who fails, it is a different matter.

Let us say that a student passed all freshman subjects, except embryology, under the old system. He might take a summer course somewhere, and on passing the subject, be eligible either to go on with his class or to transfer. The "all or nothing" rule of the new system puts such a student at a disadvantage, because so far as we are concerned the student has failed in the whole year's work and must take all the examinations again. When he wishes to transfer, he is looked upon by the school to which he applies as having failed all around and is summarily rejected. It is a fact, therefore, that under our system certain students are penalized by schools which employ the old system, in a way which their own students would not suffer and which ours would not suffer if we were under the old system.

Of course, such a student may take our examination again, and as many times as he wishes. Sometimes he passes the subject he failed before

and fails in a subject he passed before. Then he feels a grievance. Though at one time or another he has passed every subject, he still has no standing with us nor at any school to which he wishes to transfer. Our committees, particularly those governing the freshman and sophomore examinations, see no injustice in this situation, or rather feel that in the long run it is fairest to all concerned. But some members of the faculty are not so sure.

Additional Comments.—The "all or nothing" rule puts a strain on students which the old system did not involve. The capable and ruggedly organized individual gets along all right. But the nervous and worrying individual is likely to have a hard time. Some of the faculty think the system is faulty in this respect.

It does, however, have the advantage of practically eliminating the conditioned student from our classes. Under the old system there were always considerable numbers with back work and consequent irregularities of schedule to meet individual needs. Recall that no student is dropped. The facilities of the school are open to all. But one cannot go on with advanced work till a given year's subjects are satisfactorily disposed of. The present temper of the faculty is that individual concessions are not wise in the long run even for the individuals favored.

In accord with this theory, no arrangement has so far been made to take care of those who are absent on account of illness—unless they are able to write the examination in bed at the regular time, in which case they are permitted to do so. On the whole, however, no exceptions or excuses are permitted. A student who had successfully achieved, let us say, all examinations save one, and who was kept from that examination by illness or a late train, would be failed and have to write the whole examination at the next regular time. The faculty argument for such rigidity comes back to honesty of motives. If we excuse Jones because he is sick, they say, next year half a dozen Joneses will pretend to be sick in order to get a special examination and consequently more time on one or more subjects. If a student has two chances a year, the faculty say, that is enough and fair in the long run.

So far the system has worked. But I have a feeling that some time a case will arise under such circumstances as to render exception and special action imperative. Last spring, for example, a very good student was in the hospital with an acute appendicitis at the time of the examinations. In the fall he was there again, seriously injured in an automobile accident. He did not get over this till some weeks after the opening of school and decided not to go on with his class this year. But if he had been ready for work, say in two weeks after classes began, I have a feeling that his case would have demanded an exception to the rules.

On the whole, the faculty are pleased with our system and I think the

majority of students are pleased. We think the more incompetent students, some of whom under the old system of piling up course credits would eventually have graduated, are stopped at the freshman level. So far as can be judged at present, the total final elimination is slightly but not markedly greater than formerly.

We have practically gotten around the sentiment, predominant up our way, that no student should be dropped and thus permanently denied the privilege of a career. Most people are satisfied when we say the student has another chance and that all he need do is pass an examination, which though thought of as being difficult is also accounted fair.

Of course, after each examination there is weeping and wailing, sometimes malediction, at the dean's office. Fathers and mothers—sometimes prominent citizens—are certain that there must be some way by which the student who had a fair record in most of his subjects but fell down in one or two, can go on or go to some other school. The situation is still bad enough, and the dean earns his salary during the two or three days, at least, that follow the announcement of results of a comprehensive examination.

I try to offer individual advice in keeping with the records. If it looks as if the student, on the basis of his premedical record, aptitude test and the number of subjects passed, ought to make good on another trial, I advise repetition of work or such intensive study as will render such an outcome likely. If the record indicates a probably inability ever to attain the M.D. degree, I try to dissuade the student from further effort in that direction. If some of you get letters from me and from students, and if you are visited by excited parents, it is because my advice is not heeded, and because there is, to a certain extent, a logical objection to that advice. This lies in the long practice and consequent deep feeling that the student with one or two deficiencies ought to be able to make special preparation on such subjects and have provided special opportunities for examination thereon. The present judgment of our faculty is against this because, they feel, it inevitably leads to the piece-meal, credit-adding type of education which is the bane of the American school system.

SUMMARY OF COMPREHENSIVE EXAMINATION SYSTEM, MEDICAL SCHOOL UNIVERSITY OF MINNESOTA.

1. Students are examined at the end of each year's work, on the required subjects grouped by departments; i.e., all surgery courses of a year covered by one examination and so on. All examinations are repeated in the second week before the opening of school in the fall. Seniors are examined at the end of any quarter in which they complete the work of the senior year.

2. Before a student is permitted to take examinations, he must have been declared "eligible" by all departments concerned; i.e., he must have done satisfactory class work. At the completion of a course students are informed as to "eligibility"

or "non-eligibility." Lists of eligible students are sent to the Chief Examiner before an examination. Non-eligibles must repeat the course.

3. Non-medical students taking medical subjects may be given an examination under the general university rules (old course system), at the end of a course; but if they later transfer to the Medical School, they are required to take the comprehensive examination on that subject—the previous grade being acceptable only as conferring "eligibility" so far as the Medical School is concerned. Graduate students who contemplate going into medicine later, may be given a grade of "L" (eligible) on the records of the graduate school upon satisfactory completion of the required class work of a given medical school course, thus deferring the final examination until they are medical students and take the medical comprehensive examination.

4. All examinations are conducted, supervised and controlled by an examination committee for each year, under the direction of a chief examiner. Each committee consists of a representative from each department concerned.

5. In the spring, class work stops three weeks before the close of the quarter to provide time for review. The examinations are confined largely to the last week of that quarter. No review period can be provided for seniors because of their responsible work as clerks. But the senior examinations are usually scattered over the last three weeks of a quarter.

6. Practical examinations may be given at the end of a course or deferred to the end of the year at the discretion of individual departments.

7. Before an examination, the committees meet and arrange the schedule, length of examinations, etc. Each member brings with him the questions on the subjects he represents. These are gone over and revised if necessary, before being approved by the committee. Every effort is made to have the questions clearly worded and carefully selected. Questions correlating various subjects or involving subjects of the previous year may be introduced. Departments determine the type of examination to be used. Some use only the discuss type, others the objective type, still others are of mixed type.

8. Students are seated in pre-assigned seats and are identified by number only. Proctors are assigned by departments on request of the chief examiner.

9. After each part of an examination has been written, the papers are delivered to the proper department with printed instructions to have them carefully graded by qualified members of the staff. An abstract of the rules governing the grading of papers is supplied each examiner. If several members are employed, the rules require that certain questions be allotted to one member and certain other questions to another.

10. After the written papers have been evaluated and due allowance made for class records, clinics, etc., students are graded A, B, C, D and F. A means "excellent" and counts 3 points for every credit or hour; B means "good" and counts 2 points; C means "fair" or "average" or distinctly passing, and counts 1 point; D means borderline between passing and failing, and counts $\frac{1}{2}$ point; F means failure.

11. These grades are sent to the chief examiner on special blanks which contain no information other than the numbers of the eligible students.

12. The rules require that all papers graded D or lower must be read by at least two members of the department; i.e., the grade must be agreed upon by at least two examiners.

13. Students who obtain an average of C, or total points equal to the total quarter credits or hours, on the examination as a whole, and are not too low on any one subject, are "passed" and permitted to go on with the next year's work. In administering this regulation it is customary for the respective examining committees to shade the point system slightly; i.e., supposing a year's work included 50 credits requiring 50 points, the committee may pass on 47 or 48 points, passing grades having been made on all subjects and "D's" in some courses being reasonably balanced by better marks in others. The grades obtained in the various subjects as finally determined for passing students are reported to the registrar and ultimately mailed to each student. Such grades determine the student's rank within his class.

14. Students who fail a comprehensive examination are in the same good standing as before trying the examination and may take it again at any subsequent regular time. They may prepare in any way they choose—in or out of school. In the meantime, they are not permitted to register for any courses of the next year's program. They may take electives or repeat required courses. There is at present no limit to the number of times a student can try to pass an examination. For students failing a comprehensive examination no record of individual courses, whether passed or failed, is made in the registrar's office. The registrar merely records the failure as a whole, e.g. "failed sophomore comprehensive, June, 1932."

15. The comprehensive examination committee has full jurisdiction over borderline cases. Members are notified of such cases in advance of the committee meeting so that they can bring the data needed for a decision. The past record of a student is not available and he is judged solely on his class record and the examinations related to the particular year involved.

16. Students with an average well above the required C, but with a failure in only one subject, may be required to take an examination on that one subject only, in the next regular comprehensive examination. In the meantime he may or may not be permitted to go on with advanced work, depending on the nature of the failure and other circumstances. No special examinations are given. In practice the junior and senior examination committees frequently extend the privilege of reexamination in a single failed subject, but the freshman and sophomore committees seldom do so.

17. Students who fail in the comprehensive examination and who wish to transfer to some other university, may have transmitted to that university an official statement to the effect that the student has done satisfactory class work in the various subjects, but has not passed our comprehensive examination with the average grade of C or better, which is required at Minnesota for promotion to the next class.

18. A student who wishes to transfer to the University of Minnesota with advanced standing in medicine, must pass the comprehensive examination at least of the year just preceding the one he wishes to enter, or have passed the National Board, Part I, if he wishes to enter the junior year.

The Comprehensive Examination at St. Louis University School of Medicine*

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Historical Data.—The comprehensive oral examinations at St. Louis University School of Medicine are the outgrowth of a desire on the part of the Council and Administrative Board for supplementary information concerning candidates for degrees in the case of doubtful or scholastically inadequate students. This purpose was rather thinly disguised in the original announcement of the examinations as sent to both the examinees and the examiners. It was stated that "The purpose of these examinations is to determine the prospective graduate's qualifications for taking the senior examinations for his medical degree." Color was lent to the ostensible purpose by the fact that in the beginning only approximately one-half of the senior class was scheduled for these examinations, and in the minds of the students the orders of the Council to subject themselves to this comprehensive examination was interpreted as a recognition of the examinee's weaknesses as shown by the written examinations.

With the advance of time, however, the primary purpose of these examinations has been modified considerably. Experience gained from five years of experimentation has shown that these examinations have so pronounced and desirable an effect on the entire class that even in the second year the examination was prescribed as a requirement for all of the senior students.

In the same year in which these examinations were prescribed for the weaker students of the senior class, they were also prescribed for all of the students in the sophomore year as an additional test of the students' fitness for passing from the preclinical to the clinical years. Since the session 1927-1928, therefore, all students of the sophomore class and since 1928-1929 also all students of the senior class have been required to subject themselves to these examinations. Our school has, therefore, had five years of experience with both these examinations but an experience of only four years in so far as these examinations in the senior year are now a necessary prerequisite for graduation.

Procedures in Common for Both Examinations.—The character of these examinations as comprehensive oral examinations is maintained (a) by the enunciation of the principles and (b) by the wide extension of the subject matter for the examination.

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For both the sophomore and senior examinations the principle is considered basic that "The student is to be examined not so much for the memory content of his knowledge as rather for his scientific and medical viewpoints," and in the case of the senior students particularly, "for his clinical judgment." The extent of the subject matter is defined for the senior examinations to be "wide enough to embrace the entire field of medical knowledge leading up to an understanding of those conditions which interest the physician" and in the case of the sophomore students "the essentials of the entire field of the fundamental medical sciences, exclusive of pharmacology." The reason for the exclusion of pharmacology from the extent of the subject matter arises from the fact that in our schedule one of the pharmacology courses is given in the junior year.

In the case of both examinations, the student appears before a board of five examiners. The board for the senior examinations is made up of representatives of (1) the fundamental sciences, (2) the department of internal medicine, (3) the department of surgery, (4) the department of gynecology and obstetrics and (5) the clinical specialties. The sophomore board is made up of representatives of the departments of (1) anatomy, (2) bacteriology, (3) biochemistry, (4) pathology and (5) physiology.

The length of the examinations is indeterminate and is left to the discretion of the presiding officer of each board. Generally, however, one-half hour is deemed a minimum duration, and with the school's continued experience with these examinations it has gradually become the regular routine. Several faculty members, however, have expressed themselves as dissatisfied with the brief duration of these examinations and have asked that more time be given by the boards.

When the examinations were first announced the reaction of the student body indicated a certain amount of resentment that an additional requirement of such assumed difficulty should have been introduced. Persistent education, however, has gradually brought about a change of attitude, and at the present time, the examinations are looked upon as very effective and valuable assistance. This change of attitude has been brought about not only by the sympathetic attitude of the examiners in the course of the examination but even more by the follow-up interviews. Students who have failed to acquit themselves with the measure of satisfaction expected of them are usually called into conference, individually, by the dean and any other information concerning a student which may have been uncovered in the process of these examinations is made a matter of discussion.

In the case of both examinations, the instructions to the examiners suggest "that the judgment or grade of each examiner regarding the student be formed without consultation with the other members of the same

board. The judgment of each examiner should be recorded immediately after each student's examination and the reports will be handed in at the office by the chairman immediately at the end of each day's session in a sealed envelope. The examiner, however, shall be free to use such information concerning an individual examination as he may have gathered from his own personal and direct knowledge. "Hearsay knowledge either for or against the examinee should not be allowed to enter into the examiner's judgment."

A feature which has been found particularly valuable and which was introduced from the beginning of our experiment was the casting of two votes by each examiner, one a "special vote" and the other a "general vote;" the first of these being a vote of the examiner on the result of the examination which he himself gave, and the "general vote" being the examiner's judgment concerning the student's rating in all subjects in which he has been examined. Moreover, the examiners are encouraged to give additional impression in the space provided under the heading of "remarks" on the record cards. These cards are made a part of the students' permanent record files.

The comprehensive character of the examination is, moreover, stressed by the method of giving the votes. Instead of numerical grades we use the qualitative designations double plus, plus, plus-minus, minus and double-minus, these symbols being defined to mean: double plus, superiority; plus, a satisfactory standing; plus-minus, doubtful standing; minus, a deficient performance; and, double-minus, a performance of pronounced deficiency. These votes have the added incidental advantage of being relatively easy to tabulate besides being broadly and fairly uniformly interpretable. We have felt that a large fraction of the success of our examinations has been due to the grading recording procedure.

Differences in the Two Examinations.—The chief differences in the sophomore and senior comprehensive oral examinations arises from the nature of the two fields of examination as well as from the personnel conducting the two examinations.

In the case of the sophomore students, the stress has been largely laid on the correlating ability of the student. While each of the examiners in the five subjects conducts this oral examination, pigeonholing of knowledge into definite departmental compartments has been largely discouraged by the mode of questioning. It happens very frequently that the same topic is pursued with progressive prodding by the examiner in two or three or even more subjects. It is obvious, also, that the tendency of a board made up of five examiners, chosen from the fundamental departments, would be more apt to ask somewhat specialized questions than would the members of a board chosen from the clinical departments. On the other hand, in

the senior examinations the effort at arriving at an understanding of the student's clinical judgment would largely govern the mode of questioning.

Mechanics of Administering the Examination.—A brief word might be said concerning the mechanics of administering the examination with relation to (a) the choice of boards and (b) the assignment of the students to the boards.

The drafting of the boards of examiners would obviously be a matter of no little difficulty in almost every school. One hundred students require approximately 50 hours for such examinations, and if five examiners are to be occupied during this period, 250 hours must be devoted to this work. Clearly, there is a necessity of selecting four or five boards, and, this necessity being recognized, it is not always easy to select those individuals who in certain definite combinations of examiners would serve to more or less equalize the degree of difficulty which the student presenting himself to that board would encounter. It is for this reason that we have been particularly concerned with the constitution of our boards. This is made a matter of special study and the boards are not organized until after the presumed "rigor" or "easiness" of the examiner has been compared with the respective qualifications of the co-members of the same board. Considerable effort is made to study the grading by each faculty member when that person is first assigned to this duty and occasional check-ups on this point seem to be necessary. The best indication that our methods in this respect have been at least satisfactory is given by the fact that our students have registered no complaints concerning the relative rigor of the various boards.

Impartiality concerning the students is safeguarded by the procedure by which we assign the students to the boards. The students are arranged in numerical order on a chance basis, and four or five, depending on the number of boards in session, are told to present themselves at the registrar's desk in order at half hour intervals. Cards bearing the numbers of the boards are presented face down to the four or five examinees and again a chance selection is made. It is only after this double chance selection that the student is informed of the board to which he is assigned. No student or examiner, therefore, knows for more than four or five minutes in advance of the examination to which board the student is to be assigned.

The results of our experiment may be presented under the headings of (a) General Results and (b) Special Results.

General Results.—These two comprehensive oral examinations may be definitely said to have had a most salutary effect on our student body. The habitual student illusion that because a course has been taken and an examination in this subject has been passed, the subject can now be forgotten, has been definitely dispelled. The freshman student knows even at the end of his year that he must keep up his reading and his interest in his

fundamentals, if for no other reason than because the same matter on which he has already passed will form the subject matter of two additional examinations, one, one year after, and one, three years after he has completed his freshman year. Obviously, the same attitude has been instilled into the minds of the second, third and fourth year students. It is believed that the effect on the scholarship of the student body has thus been most pronounced, and in all likelihood most of our teachers would agree that no single correlating procedure which we have succeeded in devising has been more effective in making the student think in terms of scientific medicine instead of in terms of the individual fact.

A second general effect which is, perhaps, scarcely less valuable, is the attitude which has been developed in the minds of the student body toward the members of the faculty. While this result may be deemed entirely incidental, it is nevertheless real. The plan has made our student body better acquainted with the faculty members and particularly the faculty members with the students. The discussions which take place around the lunch table subsequent to one of these examinations are a sufficient illustration of what I mean. Sometimes individual students are commented on, at other times this or that faculty member voices a change of opinion concerning a particular student, and at still other times the faculty member expresses surprise that this or that boy has acquitted himself creditably, or otherwise, in the oral examinations. In the case of the senior students particularly, the members of the clinical faculty are naturally rather closely interested in those who have been given intern appointments in hospitals with which the clinician is connected, and one can thus readily understand the measure of interest which the clinician brings to bear on his examination.

A third incidental but also very valuable result has been the effect of these examinations on the faculty members themselves. A number of them, particularly among the clinical group, regard this experience as one of the most valuable experiences of the entire academic year. While it is conceded on all sides that the work is drudgery, that it is time consuming, that it demands very large sacrifices, it is also conceded that these oral examinations act as a valuable stimulus for many of the clinicians.

Special Results.—The special results of these examinations might be grouped under the following heads: (a) the correlation of the results of the comprehensive oral examinations with the class standing, and (b) the information elicited about particular departments from the grading methods.

Considerable thought has been given to the correlation of the results of these examinations with the class standing. Table I shows the results

TABLE I. SOPHOMORE ORAL QUALIFYING EXAMINATIONS

CLASS	No. of Students	VOICES										CLASS STANDING					
		+					-					Upper One-Third		Middle One-Third		Lower One-Third	
		+	+	+	+	+	-	-	-	-	-	No.	%	No.	%	No.	%
A B C 1931-32	37	17	168	...	...	...	...	...	...	...	...	17	45.9	10	27.0	10	27.0
	41	4	42	...	54	...	5	...	...	...	...	12	29.2	15	36.5	14	34.2
	50	...	58	...	161	...	29	...	2	...	...	5	10.0	24	48.0	21	42.0
A B C 1930-31	128	21	268	...	215	...	34	...	2	...	...	34	26.5	49	38.1	45	35.1
	51	56	199	...	...	...	...	...	...	...	...	23	45.0	19	37.2	9	17.6
	41	7	146	...	48	...	4	...	...	...	...	6	14.6	17	41.4	18	44.0
A B C 1929-30	128	63	398	...	146	...	33	...	...	...	...	30	23.4	53	41.4	45	35.1
	42	57	53	...	...	...	...	...	...	...	...	15	35.7	14	33.3	13	30.9
	47	2	185	...	39	...	7	...	1	...	...	11	23.4	26	55.3	10	21.2
A B C 1928-29	114	59	273	...	116	...	20	...	1	...	...	29	25.4	49	42.9	36	31.5
	49	51	193	...	...	...	...	...	...	...	...	20	40.8	22	44.8	7	14.3
	39	6	150	...	38	...	1	...	...	...	...	7	17.9	16	41.0	16	41.0
A B C 1927-28	115	58	365	...	129	...	21	...	1	...	...	30	26.1	45	39.1	40	34.7
	27	1	22	...	91	...	20	...	1	...	...	3	11.1	7	25.9	17	62.9
	27	1	22	...	91	...	20	...	1	...	...	3	11.1	7	25.9	17	62.9

for a four year period, the first year having been omitted for reasons already mentioned.

Turning first to the sophomore examinations, we have classified the students into class A, class B and class C on the basis of the comprehensive oral examinations. Class A is made up of those students who have received only double or single pluses and no lower grades. Class B is made up of those who have received some adverse votes but a preponderance of plus votes. Class C is made up of those who have received a preponderating number of adverse votes. If we take as an example the sophomore class during session 1931-1932, it will be seen that of the 37 students who are classified as being in Class A on the basis of their oral examinations, 17, or 45.9 per cent, were in the upper third of their class on the basis of their class standing; 10, or 27.0 per cent, were in the middle third, and 10, or 27.0 per cent, were in the lower third. Similarly, of the 41 students classified as Class B on the basis of their oral examinations, 12, or 29.2 per cent, were in the upper third on the basis of class standing; 15, or 36.5 per cent, were in the middle third, and 14, or 34.2 per cent were in the lower third. The 50 students who were classified as being in Class C as a result of the oral examinations, contained 5 students, or 10.0 per cent, who, on the basis of their class standing, were in the upper third of their class; 24, or 48.0 per cent, who were in the middle third, and 21, or 42.0 per cent, who were in the lower third. The same general arrangements may be found on Table I for the remaining sessions. The votes as given to all of the students in their respective classifications are tabulated in detail to give a better understanding of the general trend for those who are particularly interested in such educational statistics.

If the percentage columns under the general head of "Class standing" as given under the subheads "upper third," and "lower third," are compared, it will be seen that in the four years in which we have carried out these examinations, approximately 50 per cent of the students in the upper third also qualified for a class A rating on the basis of their oral examinations, while an additional fourth, roughly speaking, qualified for a class B rating. Similarly, in the case of the middle third students, between 36 and 55 per cent qualified for a class B rating, and finally, among the lower third students, between 42 and 62 per cent qualified for a class C rating.

Two conclusions thus obtrude themselves; first, that students qualified as being in the upper, middle or lower third on the basis of their class standing will, in all likelihood, qualify as being in class A, B and C, respectively, on the basis of their oral qualifying examinations, but a sufficient percentage of the students qualified as being in the upper, middle or lower third still drop into unexpected classifications on the basis of their oral examinations, to make one feel that the oral examinations really contribute

something of great value to the information elicited by the customary and conventional semester written examinations. The chief point of interest, therefore, lies not so much in the fact that the larger number of upper third students are also classified as class A students but rather in the fact that so many of the upper-third students should still be classified as class B or class C students. Similarly, it is not surprising that a large percentage of the students grouped as middle-third students also qualify as class B students, but it is surprising that so large a number of them should qualify as class A or class C students.

A comparative study of the results in successive session will show, moreover, that there is a fairly marked tendency for students to drop into lower classifications on the basis of their oral examinations than they were occupying on the basis of their written semester examinations. Thus, for example, during the session 1931-1932, 24 of 49 middle-third students dropped into class C on the basis of their oral examinations. In 1930-1931, 17 of 53 middle-third students met the same fate. Concerning the lower third students, it is not surprising that 62, 52, 50 and 42 per cent, respectively, should have qualified for class C on the basis of their oral examinations, but it is a matter of considerable interest that by means of this comprehensive oral examination a large percentage of lower-third students should still have merited a classification of class B or even class A standing. So much for the group results.

It would lead entirely too far to report in detail the performances of individual students. I might, by way of illustration, point to three particular students. Two years ago, graduate fellowships were awarded to students who, on the basis of their class standing were found in the middle third, and in one case in the lower third, but who had shown by their oral examinations an unusual ability to face such problems as were presented to them in the course of these examinations. The converse is also found. Students, presumably of the memory type, whose class standing is, perhaps, unduly high, are apt to be picked out from the general group by such individual attention as is given in the oral examinations.

If Table II is studied briefly, presenting as it does a summary of information concerning the senior oral qualifying examinations, the same general facts will stand out as have been pointed out for the sophomore examinations, with certain noteworthy differences, however. The correspondence between upper third on the basis of class standing, and class A on the basis of oral examinations is, perhaps, more satisfactory than in the case of the sophomore students. Similarly, the correspondence between the classification middle-third and class B, while fairly satisfactory, is still not as satisfactory as it is in the case of the sophomore students.

TABLE II. SENIOR ORAL QUALIFYING EXAMINATIONS

CLASS		No. Of Students	VOTES							CLASS STANDING					
			++	+	+ -	- -	No Vote	Total	Upper One-Third		Middle One-Third		Lower One-Third		
									No.	\$	No.	\$	No.	\$	
A B C	1931-32	51 37 16	70 9 ...	177 121 21	... 46 45	... 5 10	... ... 1	8 4 3	255 185 80	24 11 1	47.0 29.7 6.2	15 16 2	29.4 43.2 12.5	12 10 13	23.5 27.0 61.0
		104	79	319	91	15	1	15	520	36	34.6	33	31.7	35	33.6
	A B C	1930-31	44 43 20	65 8 2	152 154 15	... 46 70	... 2 10 2	3 5 1	220 215 100	17 10 1	38.6 23.2 5.0	13 17 7	29.5 39.5 35.0	14 16 12	31.8 37.2 60.0
A B C	1929-30	41 43 19	83 19 ...	121 143 27	... 47 49	... 4 19	... ... ...	1 2 ...	205 215 95	18 9 4	43.9 20.9 21.0	16 14 7	39.0 32.5 36.8	7 20 8	17.0 48.7 42.1
		103	102	291	96	23	...	3	515	31	30.0	37	35.9	35	33.9
	A B C	1928-29	39 47 17	64 17 ...	130 132 17	... 38 36	... 26 22	... 1 10	1 1 ...	195 235 85	15 14 1	38.4 29.9 5.8	11 18 10	38.2 38.2 58.8	13 15 6	33.3 31.9 35.2
		103	81	279	94	48	11	2	515	30	29.1	39	37.8	34	33.0

As for the correspondence between lower-third and class C in the case of the senior examinations, the result of, at least, the last year would seem to indicate that the class standing group is quite satisfactory with approximately, however, one-fifth of the students in a doubtful group. In general, regarding the correspondence between conventional class standing and classification on the basis of the oral examinations, we may say that while these correspondences are fair they still leave enough non-corresponding facts to make us feel reasonably sure that we have found in our oral examinations an additional source of information concerning the mental capabilities of our students which are most subject to investigation through such a mechanism as we are now using. It is entirely too early to reach final conclusions regarding these qualifications. The next step in the process should obviously be a series of experiments to devise the proper types of questions, diverse kinds of environments and, perhaps, different kinds of examining boards in order to elicit still more fully the information which every school administrator desires. For this year we are planning a more extensive study of the correlation between the aptitude test and the results of the sophomore oral qualifying examinations.

Another important by-product of these examinations is the information concerning the demands which various departments make on their students. It would lead us entirely too far afield to pursue this matter in detail. If, however, the results of the four years are taken, we have a fairly reasonable basis for getting some light on departmental requirements. Thus in the senior examinations, representatives of the fundamental sciences gave only 9 per cent of the double plus grades; the department of gynecology and obstetrics gave 17 per cent, the department of surgery, 23 per cent, the various specialties 24 per cent and the department of internal medicine 26 per cent. At the other end of the scale, the fundamental departments gave 25 per cent of the double minus votes. The same percentage is given by the department of gynecology and obstetrics. The department of surgery gave 13 per cent; the department of internal medicine 18 per cent, and the medical specialties 21 per cent of these negative votes.

In the sophomore oral examinations the smallest number of double plus votes was given by the department of bacteriology with the departments of physiology, biochemistry, anatomy and pathology occupying second, third, fourth and fifth place, in the order named. The greatest number of double minus votes was given by the department of physiology with the department of biochemistry and the department of pathology in second and third place, respectively, and the departments of bacteriology and anatomy in fourth and fifth places, respectively. Thus far the suggestions contained in these and much other data which we have accumulated have not been fol-

lowed out adequately. A number of special studies, of more than passing interest, suggest themselves.

A further by-product similar in trend to that just spoken of is afforded by these results. The impression is quite common that the teachers of clinical subjects, at times, are apt to be lenient in their grading. If this is true with reference to the written examinations, it does not seem to be true with reference to the written examinations, it does not seem to be true with reference to the oral examinations. As far as our data can be utilized in the formation of a judgment, it would almost seem as if the clinical faculty is more rigorous than the fundamental faculty in the assignment of these votes. At any rate, the pointing out of these relationships to both fundamental and clinical teachers affords opportunity for efforts to maintain adequate teaching standards, and they have been used as a stimulus for increased interest in teaching.

CONCLUSIONS

I submit the following in summary and conclusion.

1. A comprehensive oral examination has been in use in our school during five consecutive sessions for the sophomore and senior students.
2. The procedure has yielded much additional supplementary information concerning the capabilities of individuals and the scholarship standing of class groups.
3. The results of the oral comprehensive examinations have been found to be in accord with class standing ratings in somewhat more than one-half of the class but have developed enough suggestions concerning the unreliability of class standing ratings to make us eager to continue our oral examinations as a supplementary source of understanding of the students.
4. The oral comprehensive examinations yield a number of interesting and valuable by-products, chiefly as a stimulus of the faculty and as an indication of the departmental requirements of student scholarship.

The Comprehensive Examination in Theory and Practice*

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The comprehensive examination was instituted at the Yale School of Medicine in 1927 for students who were ready to begin work in clinical medicine and public health, in 1928 for students who had completed their work in clinical medicine and public health and were ready for graduation. It is my purpose, first, to present briefly the theoretical principles which led us to substitute these two comprehensive examinations for the previously used multiple examinations in course, and, secondly, to describe equally briefly the technic employed in conducting the examinations. While our faculty, I feel sure, are for the most part convinced of the advantages of the comprehensive examination, I shall not endeavor to draw any specific conclusions concerning these possible advantages, since conclusions can be only a matter of opinion in the absence of a controlled experiment in which both plans of examination were carried on simultaneously.

Theory.—Four major theoretical considerations formed the basis for the plan adopted. These were as follows:

1. The purpose of a comprehensive examination is to determine whether an individual is qualified to pursue specific activities, first, by reason of his factual knowledge; second, because of his ability to comprehend and correlate this knowledge; third, because of his capacity to utilize his knowledge for the solution of the problems with which he will be confronted. The first involves memory, the second understanding, and the third skill and judgment.

2. Since the comprehensive examination is given to determine whether an individual is qualified to pursue certain definite activities, in this case, first the study and later the practice of clinical medicine, at least in so far as the majority of medical students are concerned, it should be regarded as an admitting examination rather than a passing along examination. In other words, the examination should be given and evaluated by those working in the field of activity toward which the student is advancing rather than by those whose tutelage he is leaving. More specifically, the examination for entrance into the courses in clinical medicine and public health should be given by the faculties in these subjects, not by the faculties in the basic biological sciences. Similarly, the comprehensive examination at the end of the medical school course should be given not by the faculty of the

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school from which the student is about to graduate but by an impartial outside examining board.

3. The responsibility for the comprehensive examination should be placed on the best and most mature men available with respect both to the content of the examination and the evaluation of the qualifications of the examinees.

4. The examinations should be so graded as to show, in so far as possible, the actual spread in the qualifications of the examinees rather than according to the more usual method in which a stated grade indicates success or failure.

Technic.—As I describe the technic that we have used in our attempt to put the foregoing theories concerning the comprehensive examination into effect, it will become obvious that we have not succeeded in satisfying completely the theoretical requirements, but have either compromised here and there because of differences in opinion concerning the interpretation of the theories, or have partially failed because of human limitations or unavoidable difficulties in the application of the methods employed to meet the requirements of the theoretical ideal.

Two comprehensive examinations have been used, the first for students who have completed the required work in the basic biological sciences and are ready for admission into the courses in clinical medicine and public health, the second for students who have completed their clinical studies and are ready to qualify for the M.D. degree and consequently to begin the practice of medicine or other work in related fields. The first examination covers the subjects of anatomy, physiology, physiological chemistry, pharmacology and toxicology, bacteriology, immunology and pathology; the second, public health and all the major branches of clinical medicine. The first examination, since the school is on the trimester system, has been offered three times a year—in December, March and June—the responsibility for decision as to whether he was prepared to take the examination having been placed on the student. The second examination, since the university at present awards degrees only in June, has been offered only once a year.

Since, up to the present, the first examination has more nearly met the theoretical requirements outlined above, I shall confine my remarks largely to the technic employed in this examination, with a few additional comments concerning the second.

In the first place, in order definitely to foster the conception that the examination is an admitting rather than a passing along examination, it has been specifically called "The Comprehensive Qualifying Examination for Admission to Clinical Medicine" and the examinees have been referred to as candidates for admission.

To meet the second theoretical requirement, namely, that the examination should be conducted by those with whom the student is about to work rather than by those with whom he has been working, the responsibility both for preparing and giving the examination and also for evaluating the qualifications of the candidates has been placed in the hands of the faculties of clinical medicine and public health as represented through an examining committee of these faculties. This was not accomplished completely at one stroke. At the beginning, because of a rightful and quite natural desire on the part of the faculties of the basic biological sciences to safeguard the adequacy of an examination dealing with their subjects, a joint committee of both faculties conducted the examination. Gradually, however, the clinical faculty has assumed an increasing responsibility for the examination, and during the last three years has been wholly responsible.

The third requirement, namely, that the responsibility for the examination should be placed on the best and most mature men available, has been met by the simple device of having the examining committee consist of the full professors in clinical medicine and public health, at present eight in number. This committee determines the nature of the examination, the questions which are given in the written parts of the examination, as a group conducts the oral part of the examination, and finally determines whether the candidates are qualified.

To meet the fourth requirement, namely, that the grading of the examination shall indicate the actual spread in the qualifications of the candidates, an effort has been made to have the marking and scoring of the examinations show a wide numerical spread between the best and poorest candidates, with emphasis on the fact that no predetermined score necessarily indicated failure or success in qualifying. While there has been some variation in the total spread possible in different examinations, the possible spread has usually been in the neighborhood of minus 80 to plus 200. Under these circumstances, when any considerable number of students have been examined at one time, the results of the grading have shown three distinct groups—(1) a relatively small high-score group, separated by an interval from (2) a relatively large intermediate-score group, which is again separated by an interval from (3) a small low-score group, each group presenting a peak approximately at the middle point of the spread within the group. The greatest difficulty encountered in the application of this method of grading obviously would be and has been in changing the marking habits of the examiners, who had been accustomed to grade examinations on the basis of a stated per cent marking the point between passing and failure to pass. A fair degree of success, however, has gradually been attained.

Character of the Comprehensive Qualifying Examination for Admis-

sion to Clinical Medicine.—This examination, which has been held 12 times, has been made up of three or four parts.

Part I, devised primarily to test factual knowledge, has consisted of from 70 to 100 so-called short answer questions to be answered in five words or less. In the earlier examinations the questions were grouped under the headings of anatomy, physiology, physiological chemistry, pharmacology, pathology and bacteriology and immunology. Later the headings were abandoned and definite grouping given up. The number of questions in any one subject has varied from a minimum of 10 to a maximum of 17.

Part II, devised especially to test comprehension and ability to correlate, as well as memory, has consisted of 18 so called long answer questions, of which 12 had to be answered. As with Part I, these were at first grouped according to subject matter. Subsequently the grouping was abandoned and questions which would involve two or more of the basic biological sciences in the content of their answers were frequently used.

Part III, in the first four examinations, consisted of an essay on a selected subject. Because of the difficulty experienced in satisfactorily grading these papers, the essay was given up and a practical laboratory examination was given, designed to test the ability of the candidate to utilize his knowledge and experience. Except in one instance, this was conducted orally with individual or small groups of students at a time. For unavoidable reasons it was omitted in two of the June examinations.

Part IV has been an oral examination. The method of conducting this part of the examination has gradually been evolved with increasing experience. The essential features of the present method are as follows: (1) the oral examining board consists of the full professors in the departments of clinical medicine (internal medicine, obstetrics and gynecology, pediatrics, psychiatry, surgery and public health); (2) the members of the examining board, with the exception of the chairman, are unaware of the rating of the candidates in the first three parts of the examination; (3) candidates appear individually before the board sitting as a whole, each member of which asks such questions as he chooses; (4) when the number of candidates is relatively small, as is usually the case in the December examinations, all are called for oral examination; when relatively large, as in the June examinations, the chairman selects those who are called on the basis of the ratings on the first three parts of the examination, ordinarily the lower third to half of the group.

Preparation and Selection of Questions.—By arrangement in the examining committee, each member is made responsible for the preparation of a specified group of questions. He may prepare these himself or obtain them from other members of the faculty, as he chooses. From the ques-

tions submitted, the committee as a whole selects those to be given on the examination.

Grading the Examinations.—The method of grading Part I is that commonly employed with short answer factual questions, plus 1 for a correct answer; minus 1 for an incorrect answer, thus giving a possible spread of minus 80 to plus 80, if 80 questions are asked. Each question of Part II is rated on a scale of 0 to 10, giving a possible spread of 0 to 120 on the 12 questions. Part III, when given, has been rated on a scale of 0 to 40 to 0 to 60, with an equivalent possible spread. The actual grading has been done by members of the faculty of professorial rank, fully one-half, or more, by the members of the examining committee itself.

Qualification of Candidates.—Candidates who are not called for the oral examination are qualified simply on the basis of their relatively high rating on the first two or three parts of the examination, as the case may be. For candidates who are called for oral examination, a somewhat different method is used. On the oral examination each examiner independently rates each candidate on a scale of 0 to 10 and in addition makes note of his mental traits. Following the completion of the oral examination, the ratings on the written and practical parts of the examination are made available to the examining board which decides in conference on the basis of the rating on Parts I, II and III, and the rating and impressions gained of the candidate on the oral examination whether he shall be qualified or not. The final decision would appear to be as objective a one as can be devised, since the candidates are identified throughout only by number and are not known personally to members of the oral examining board.

Results.—The results of the 12 examinations given from June, 1927, to June, 1932, were as follows:

Number of individual candidates.....	291		
Qualified on first examination.....	227	78.0%	
Not qualified on first examination.....	64	22.0%	
Withdrew after first failure.....	9	3.0%	9
	55		
Preparing for second attempt.....	10	3.5%	
Number taking a second examination....	45	15.5%	
Qualified on second examination.....	32	11.0%	
Not qualified on second examination....	13	4.5%	13
Eliminated (third trial not permitted)			22 7.5%

Comprehensive Final Examination for Graduation.—Until June, 1932, the final comprehensive examination in clinical medicine and public health has not fulfilled one of the major theoretical requirements set forth at the beginning of this paper, namely, that it should be given not by the facul-

ties who have been giving instruction to the student in the subjects on which he is to be examined but by an impartial outside examining board, for the simple reason that no such examining board has been available. In other respects the methods of preparing, conducting and grading the examination have been fairly similar to those used in the Qualifying Examination for Admission to Clinical Medicine, consequently they need not be presented in detail. The major difference in the character of the examination has been the substitution of long answer questions for short answer questions in the first part of the examination.

NEW PLAN

In 1932, through the generous cooperation of the National Board of Medical Examiners, a plan was worked out by which Part I of the National Board examination could be substituted at the option of the student for the written part of our own comprehensive qualifying examination, and Part II for the written part of our final examination. Only 3 of 47 students elected to take Part I, while more than one-half of the graduating group elected to take Part II. This plan will be required during the current academic year. How successful it will be, only future experience can determine. It is to be hoped that it will prove to be thoroughly satisfactory.

DISCUSSION

On the papers of Drs. Lyon, Schwitalla and Blake.

DR. HUGH CABOT (Mayo Foundation, University of Minnesota): I have been interested in and concerned with this comprehensive examination since 1914 when it was first instituted in a preliminary way in the Harvard Medical School. It was instituted in Harvard College at an earlier date and has been there carried on continuously since that period and extended very much so that one has at one's disposal a study of the principle of the comprehensive examination in undergraduate work and medical work.

I do not hesitate to say that I believe it has announced a distinct change in our attitude toward students and a distinct change in our ability to study them. On the other hand, there are two distinct aspects of the situation. It is of great value in showing the roundness of a student, and it is a very searching test of the faculty, which is almost equally important.

At Harvard and, I think, elsewhere, it has been the duty of the examiners to report to the proper authorities in what fields they found students weak and where that continued to occur, it was a clear indication that the teaching in that field was weak.

It seems to me of great importance to try to utilize as far as possible the more or less outside examiner. I think it is true, though my experience would, perhaps, not qualify me for an opinion, that, on the whole, our knowledge of methods of the examination, particularly of this type, is in this country inferior to that existing

elsewhere. It seems to me that I see in other countries more skillful examiners than I do here, and I believe it to be due to the fact that there are more people concerned as external examiners with the study of the qualifications of students.

It also seems to me of the first importance that if this experiment—I think it still is an experiment—is to fulfill its greatest usefulness, it really should be comprehensive. It should get away entirely from class and subject field matter. I hold the opinion that the ability to pass an examination covering—Dr. Blake has been doing this—the qualifying work should require an examination of such a character that it cannot be passed by a candidate who has only a thorough knowledge of each field. In other words, it is a comprehensive examination; it must require something more than an entirely satisfactory knowledge of each of the integration of those fields and of the implications of one field as concerns another.

That principle, I think, was very clearly established in the examinations conducted in Harvard College, and led very soon to what appears to me to be almost inseparable from this method of examination, the institution of the tutorial system. There, for instance, each student working for a comprehensive examination has a tutor who is not concerned with the field in which this student is particularly concerned, but whose qualifications are such that he is supposed to have a very broad view of all of the fields concerned.

It is the business of that tutor to see that the student browses, at least, and probably does something a good deal more, in fields not directly covered by the subject matter of various courses, and I am inclined to think that the true comprehensiveness of the examination can be best obtained in that way.

It, of course, introduces a great many complications. It is not perfectly clear to me that the tutorial system is as essential to success in a professional school as it is in an undergraduate curriculum.

It appears to me of first importance that examining boards should not only consist of people who have no interest or concern with the individual student, but that they should be in almost no way limited as to the time they may take in extracting from a student, by any method they see fit, his actual knowledge. I think I have come to the conclusion that both written and oral methods are desirable. I am perfectly sure in my own mind about the oral method. I am somewhat less sure about the written method.

In regard to the oral method, it appears to me to test certain qualities which are particularly essential in the preparation of a physician; in other words, immediate availability of knowledge, ability to face intellectual emergencies, as he will in his future career have to face physical emergencies.

In my own experience with this examination I have encountered many students who were very highly qualified as regards their ability to write very soundly on the subjects concerned but whose knowledge was unavailable, who could not meet an intellectual emergency. I have become very suspicious, and have had some confirmation of it, that those people would show themselves unequal to meet the physical difficulties with which they would be faced in the practice of medicine; so in that regard, it seems to me, the oral portion of these examinations is particularly important and should not be limited in time. With one student I think one can find out in a few minutes that he is or is not satisfactory, though it is more difficult on the "not" side. With other students one has to allow a certain amount of latitude. I have seen students for whom it seemed to me that not

less than three hours would be required to give an examining group a satisfactory opinion, whereas with other students fifteen or twenty minutes would be sufficient. So that in scheduling these examinations it is very important to allow the board to have great freedom in regard to the amount of time that they may spend with any particular candidate.

Most of my experience, practically the whole of it, has been concerned with a final comprehensive examination which may be regarded as a qualifying examination for the applicant for a degree, and there I have felt quite sure that it was important to include on the examining committees representatives of the basic fields, partly because I think that in that way one gets a better balanced examination, but perhaps most importantly for the development and instruction of the faculty.

It is surprising how after five or ten years an examiner from a basic field begins to become almost human in regard to his relations with students in advanced clinical medicine and other fields, and I have believed that this has a very important effect in improving the teaching in the basic fields in relation to the clinical field. Furthermore, what I think is quite important, though probably less applicable than it was to those of my generation, it tends to keep the examiners in the clinical field at least with a bowing acquaintance with the unquestionably basic subjects with which they are supposed to be familiar and which in my generation at least was rarely the case. It seems to me I clearly detect in the younger generation of teachers, in the group to which Dr. Blake belongs, an enormously higher qualification for the competent examiners than those in my generation will ever have.

MR. EVERETT S. ELWOOD (Executive Secretary, National Board of Medical Examiners): It may be of interest to many present to know that during the past two or three years the National Board of Medical Examiners has been asked by several of the medical schools to cooperate with them in the final examination.

The plans set up at the schools already making some use of the National Board examination vary considerably. Dr. Blake has given you the plan at Yale.

Of course, the whole undertaking is still in a somewhat experimental stage at all of the four schools that are making some use of the National Board examinations, either in lieu of their own final written examinations or in conjunction with their own final examinations. At one school the candidate is given the option of taking either the school comprehensive or the National Board examination in Part I at the end of the second year and in Part II at the end of the fourth year. At another school all students are required to take the National Board examinations in Part I at the end of the second year and Part II at the end of the fourth year. In this school, however, the privilege of reviewing the answer papers is given and placing their own appraisal on them before forwarding them to the National Board. They are then graded by the examiners of the National Board in the usual way, and these grades become a part of the records of the National Board examinations.

Of course, thus far no arrangement has been made which includes the use of the National Board examination in Part III. It is a practical and clinical examination and much emphasis is placed on it. The records of the Board sometimes indicate that candidates making relatively poor marks in Part I and II, do surprisingly well in Part III, and, of course, the reverse is also true.

From the student's point of view the plan in use at Yale does this: It gives

him one examination which carries weight in his medical school record; which, if successfully passed, earns the National Board certificate. This, in turn, is good without further examination, except brief oral examination in two or three states, for license in forty-two states in this country. The certificate is also recognized in a number of foreign countries. From the candidate's point of view, therefore, it is undoubtedly a boon to him to be able to clear up this amount of credit with the one examination.

On behalf of the National Board of Medical Examiners I wish to say that it appreciates the confidence expressed in its examinations and its method of conducting them by the use of the examination in a cooperative way by the medical faculties, and at the same time it appreciates the additional responsibilities which this confidence places on the National Board's work. It stands ready to cooperate to the fullest extent with any schools making a similar use of its examinations. It realizes that the plan is still somewhat of an experiment and that modifications may be desirable. The Board is always ready and glad to receive criticisms or suggestions from the faculties of medical schools.

Dr. W. L. Moss (University of Georgia): For seven years I was a member of the committee which conducted the fourth year general examination in the Harvard Medical School. The experience gained was a very liberal education to the members of the committee.

The nature of the examinations and method of conducting them were left entirely to the discretion of the committee. They were written and oral, at the bedside and in the laboratory. They were made just as comprehensive and as much time was allowed as the members of the committee felt was necessary.

As a result of the first year's experience, the committee found four men, as I recall it, who had passed all of their other examinations and, but for this final comprehensive examination, would have been graduated and allowed to go out with the school's approval of their qualifications to practice medicine. The committee felt, however, that these men were not adequately qualified and their degrees were withheld until deficiencies were made up. This experience led to the conclusion that the fault lay with the promotion boards, and the committee urged these boards to scrutinize more carefully the records of the students for their fitness to pass to the next higher class.

It seems to me that we have a very definite responsibility to the student in this respect and that we are unfair to him if we allow a man to go past his first year if he does not present reasonable evidence that he is going to qualify for his degree at the end of four years. It is an economic loss to the school as well as an injustice to the student. I think a serious responsibility rests with the promotion board, especially that of the first year.

I am impressed with the value of the qualifying examination at the end of the preclinical studies. The instructors in the preclinical studies should participate in giving this examination but I think the decision as to whether a student's preparation in the preclinical subjects qualifies him to enter the clinical branches should be left largely to the instructors in those branches.

Dr. E. P. LYON: Several have made inquiry about the University of Chicago pamphlet, "Comprehensive Examinations Given in the Four Introductory Courses, June, 1932." It is distributed by the University of Chicago bookstore and the price is 65 cents including postage.

Regarding our own examination, you probably gathered that I am critical of it chiefly on the ground that there is no facility or possibility, you might say, of giving personal consideration to individual cases.

This Fall, for example, we had a junior who had failed twice by a margin of one subject only, and each time on a different subject. It seemed to me that that man might well be permitted to appear before a committee for an oral examination and be given that additional opportunity to demonstrate whether he had sufficient knowledge to go on with senior work this year. I called a special meeting of all examining committees to discuss this case and a few other cases. They promptly fell back on their reaction of the last four or five years, namely, that consideration of individual cases is, on the whole, an unfair and dangerous procedure.

I suppose that part of their attitude is due to the fact that under the quarter system we were in a worse situation even than under the semester system in regard to the piecemeal character of the final results, but I feel that our system is defective in not offering a mechanism in a few exceptional cases, for another chance through personal appearance before the examining board for oral discussion of qualifications.

REV. ALPHONSE M. SCHWITTALLA: I was glad to hear Dr. Cabot speak of the effect of this examination on the faculty. If you watch the issuance of books in the library shortly after one of these examinations, you will find that the number issued to the faculty members increases from 10 to 25 per cent in one year. I noticed that it increased 25 per cent in the first week after examination.

It undoubtedly does serve as a stimulus. The discussions held in the faculty diningroom become decidedly more pointed and concern themselves much more with matters of interest to the various examiners. I think that this is one of the very important results of this type of examination.

I am not so sure that I agree with Dr. Lyon regarding the desirability of the impersonal character of this comprehensive examination. I think Dr. Cabot made a passing remark on this point. It seems to me that one of the large advantages to our school of the comprehensive examination has been the fact that there is a decidedly personal character to this examination. We have felt that the objective form of examination and the impersonal character of the usual semester examinations takes care of that phase of our efforts in the study of the student, but that in some way or other this oral examination adds a decidedly personal note to the appreciation of the faculty of this or that boy. Particularly is this the case with regard to students who might be considered to be in the more or less doubtful class.

We have succeeded in discovering boys who have escaped the classification of being superior students in the course of four years. We have discovered a few of those students who have stood out from the others and later on, by internship, proved their really superior character that somehow was disguised in the impersonal methods previously followed in our examinations.

I have on hand a study I could not report because of lack of time, an evaluation of students who have gone through the oral examinations by the superintendents of hospitals and chiefs of staff of hospitals to which our students have gone. They are a clear indication that there is a definite value in the oral examination. I think our various recommendations are to be more constant to the oral examinations and they will be much more valuable to the various institutions, and

while the ordinary semester examination should take care of the objective and impersonal study of a student, the oral comprehensive examination should take care of the more personal study of that student on the part of the faculty.

Regarding the unlimited time that should be devoted to this examination, an instructor once told me that if he could not find out in twenty minutes what a boy knew, the professor had better start the course all over again. Perhaps there is some truth in that statement. Some students are allowed to come back for the examination. We have set an arbitrary limit. It is not a limit, as a matter of fact, but has worked out that way, a limit of a half-hour, but on several occasions the students asked to come back when the faculty was not satisfied with the examination given. In one case the student came back three times.

Regarding the elimination of students through these examinations, we have on three different occasions kept back a senior student from examination on the basis of his showing in the oral examination. The students came back and all three graduated finally, but we felt we were not ready to give a degree to an individual who showed as poor a standing as these three persons had made.

DR. FRANCIS G. BLAKE: Someone raised a question about the relative severity of clinical and biological science faculties in marking examinations. It is my impression, at least at Yale, that the clinical faculties are more rigid because of a somewhat different point of view. I think they are a little more impressed with the point of view that it is part of their business to protect the public as their first aim rather than to coddle the student.

To illustrate this: In one of the early examinations the clinical group failed sixteen out of fifty-two candidates appearing for the qualifying examination.

I agree thoroughly with Dr. Cabot and Dr. Schwitalla that the examinations have educational value for the faculty as well as for the students.

I should also like to emphasize Dr. Schwitalla's remarks concerning the value of the oral examination. Because of the personal contact with the student during the oral examination, a great many facts concerning the man as an individual come out which are not learned at all by the written examination. Our examining board notes down comments concerning the personality and mental traits of the individual candidate in addition to their ratings on the actual answers that the students give. In one respect this has been, I think, particularly valuable to us. Perhaps inevitably a few students are admitted to the school who, though having very high standing in their collegiate credits, nevertheless are, because of personal mental traits, unable to meet the demands of the practice of medicine, a point emphasized by Dr. Cabot in his remarks, actually, students who have a definite psychopathic personality background. In our experience that personality background is often not as readily detected by men in the biological sciences as by the clinical group, who through long experience in clinical medicine are constantly confronted with the necessity of making such decisions about individuals.

Study of Student Accomplishment Freshman Class of 1931*

FRED C. ZAPFFE

Secretary Association of American Medical Colleges
Chicago, Illinois

At the annual meeting of the Association held in Indianapolis in 1928, a resolution was introduced by Dr. A. S. Begg, dean of Boston University School of Medicine, to the effect that the Association make a study of the accomplishment of the freshman students each year, and that the results of this study be made available to the colleges of liberal arts and sciences in which these students did their premedical work. It was felt that such a study would prove of value to these colleges. No similar study has ever been made.

The first study included the freshman class of 1928. Further studies were made of the classes of 1929, 1930 and 1931. All of the medical schools cooperated splendidly in the work thus making it possible to secure complete reports for every college of liberal arts on those of its students who entered a medical school.

At the completion of each study, notices were published in various publications which it was felt would reach these colleges or some member of their faculties stating that a report on their students could be had by writing to the Association. Each succeeding year since the commencement of the study a larger number of colleges have asked for a report, and the opinion expressed by all of them has been that it has proven of great value. Some schools have undertaken reorganization of courses. Some have expressed the hope that the study would lead to a closer cooperation between the college and the medical schools in the selection of medical students. Some have stated that certain students whose records were not commendable would not have been recommended for acceptance by the college if it had been given an opportunity to participate in the selection of students for admission to medical schools.

A considerable number of admission officers of medical schools have stated that the lists furnished them have helped in the selection of students by making it possible to refuse to accept students coming from colleges whose record year after year was not good; that is, if the number of failures has been considerable over a period of years, students from such a college were not accepted.

This report concerns the freshman class of 1931. It is entirely a statistical study, hence it is rather difficult to draw any conclusions, although

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a round table discussion of the results would doubtless bring forth much of value. A summary of such a discussion might serve as conclusions. However, it contains a considerable amount of information that cannot fail to prove of value to both college and medical school. For further enlightenment, in many of the tables comparative figures for 1930 and 1931 are presented.

Correlating the number of students reported on in this study with the number matriculated at the beginning of the year, as shown by the biographic record blanks filed with the Council on Medical Education and Hospitals of the American Medical Association, it is noted that there is considerable disagreement. For example, in 1930, biographic blanks were filed by 6,645 students, but only 6,315 were reported on at the end of the year, a difference of nearly 5 per cent. In 1931, the disagreement was too slight to compute, less than 10 students. It is impossible to account for the 5 per cent difference, except to assume that these students, finding medical study difficult or not to their liking, dropped out in the first week or two of the course, hence were not reported on as members of the class. A similar disagreement in figures was noted in the studies of the 1928 and 1929 classes.

Observations extending over many years have shown that the freshman mortality has always been about 15 per cent. It was slightly less than that in 1930 (14.2 per cent) and slightly less in 1931 (13.1 per cent). Can this be charged to better preparation for the study of medicine?

The number of students with a clear record is slightly higher for 1931 (69.6 per cent) than for 1930 (68.5 per cent) and there is a slight reduction in those with an encumbered record for 1931, 17.2 per cent as against 18.3 per cent for 1930.

Economic conditions are strongly reflected in the greater numbers of withdrawals for financial reasons, 130 in 1931 as against 16 in 1930. Of course, it must be noted that in 1930, 164 students withdrew for "other reasons" than failing scholarship, illness or finances as against 96 in 1931. Insufficient data may have failed to make it possible to classify this group properly as failing scholarship or illness or lack of money. Nevertheless, the same charge may be laid against the 1931 report, but it does fit in with the times. However, the study of applicants in 1932¹ does not entirely support this view as there was not an appreciable falling off in the number of applicants over previous years, especially 1929, the peak of economic affluence.

In 1930, 47.5 per cent of the matriculants had a bachelor's or other degree; in 1931, 51.5 per cent had a degree. The number of students with only 2 years of college work has become less year by year since the

1. J. Assn. Amer. Med. Colls., March, 1933, p. 64.

beginning of this study in 1928. It fell from 22.9 per cent in 1928 to 19.5 per cent in 1930 and 19 per cent in 1931. In the 1932 class (study to be published later) the 2 year men fell off to 16.5 per cent, whereas the degree men increased to 52.7 per cent. There was a corresponding decrease in the number of students coming with only three years of preparation, from 30.7 per cent in 1928 to 26.5 per cent in 1932.

There arises the question whether these figures can be regarded as evidence of a desire on the part of students to secure a better preparation for the study of medicine, or that they feel that their chances of securing admission to medical school are increased by more years of study, especially if a degree is secured.

The figures given in Tables 3, 4 and 5 throw light on the performance of degree men and non-degree men, respectively. The degree men make the best showing, although the difference between the two groups is slight—3 or 4 per cent. It is noteworthy, since there has been much discussion of the topic in recent years, that the A.B. men have a much better record than the B.S. men. Culture scored more points than science in this contest, although the score was a close one.

Tables 6 and 7 confirm the contention of many that it is worth while to give a failing student another chance. Of 133 repeaters in 1931, only 8.4 per cent made another failure. It would be interesting to know the fate of the 81.6 per cent in the subsequent years of the medical course.

The women students (Table 8) seem to have held their own well as against the men students. True, their number is small, but their record is about as good as that of the men students.

The figures shown in Table 11 seem to prove conclusively that the students coming from approved colleges have much the best record over students coming from non-approved colleges. Considerably fewer of the second group had a clear record, and many more were dropped or failed than of those comprising the first group. Unfortunately, data on the pre-medical preparation of these students are not available at the moment for comparison of both groups. They could be worked out if time permitted.

Summarizing the results of this study briefly, it may be said that longer preparation for the study of medicine is of advantage; that a cultural course of study is better than a science course; that the failing student should be given another chance—probably only special cases, however, not all of this group; that a student coming from an approved college is more likely to make a good record than he who comes from a non-approved college.

This study is being continued for the 1932 class. A complete correlation of the results of the five years covered by the study will doubtless give valuable information to liberal arts colleges and medical schools.

Despite the careful selection of medical students made by all medical schools, the mortality rate has remained virtually unchanged over a period of many years—both at the end of the first year and at the end of the fourth year. Data at hand show that from 20 to 25 per cent of every entering class fail to graduate. Doubtless, the main reason is poor scholarship in medical subjects. Perhaps, many of these failing students would have done better in fields other than medicine. In the absence of any data on this point, this cannot be more than a suggestion, but it would be interesting to have the correct answer.

Many liberal arts college student advisers have stated with considerable positiveness that their failing students would not have been admitted to any medical school if their recommendations had been sought, or heeded when given. Unfortunately, letters of recommendation have not always proven to be a reliable source of information; hence they are often either not asked for, or when received are disregarded or their face value is discounted. It would seem, however, that the opinion of a student adviser should carry some weight, far more so than the opinion of one or more of the student's teachers. The former is likely to be impartial and unbiased. It is greatly to be desired that this study will be the means of bringing about cooperation and unity of effort between college student advisers and admitting officers of medical schools in the selection of medical students.

It is possible, of course, that such cooperation will result in the acceptance of fewer medical students, but, if so, it will be in line with present trends—fewer but better prepared physicians.

In addition to the fourteen tables presented herewith, a list of the 612 colleges sending students into medicine, and the accomplishment of the students from each school has been prepared. It is too much matter to be published as a part of this report, but a copy of the arts colleges list has been sent to the dean of every medical school in membership in the Association.

TABLE 1—DATA ON TOTAL NUMBER OF STUDENTS.

	1930		1931	
Total number of students.....	6315	%	6097	%
Clear record	4325	—68.5	4245	—69.6
Conditions	694	—10.9	579	—9.5
Failures	299	—4.7	317	—5.2
Conditions and failures	61	—0.9	33	—0.5
Incompleted work	112	—1.8	123	—2.0
	1116	—18.3	1052	—17.2
Must repeat	56	—0.9	81	—1.3
Failed	202	—3.2	137	—2.3
Dropped	334	—5.3	269	—4.4
Withdrew	234	—3.6	313	—5.1
	1930		1931	
Scholarship	54		87	
Illness or Finances	16		130	
Other reasons	164		96	
	826	—14.2	800	—11.6

SUMMARY

	1930	%	1931	%
Total number of students	6315		6097	
Clear record	4323	—68.5	4245	—69.6
Encumbered record	1166	—18.3	1052	—17.2
Definitely out	826	—14.2	800	—13.1

TABLE 2—COMPARISON OF SCHOLARSHIP OF STUDENTS ATTENDING MEDICAL SCHOOL OF THEIR OWN UNIVERSITY AND THOSE ATTENDING OTHER MEDICAL SCHOOLS.

	1930		1931	
Total number of students	6315	%	6095	%
At own university	2414	—38.2	2396	—39.3
At other schools	3901	—61.8	3701	—60.7
I. AT OWN UNIVERSITY				
Clear record	1776	—72.9	1756	—73.3
Conditions	230	—9.5	213	—8.9
Failures	83	—3.4	88	—3.6
Conditions and failures	23	—0.9	11	—0.4
Incomplete	59	—2.4	75	—3.1
	395	—16.2	387	—16.0
Must repeat	20	—0.8	28	—1.2
Failed	57	—2.4	51	—2.1
Dropped	101	—4.2	89	—3.7
Withdrew	65	—2.5	84	—3.3
	1930		1931	
Scholarship	8		19	
Illness or finances	4		42	
Other reasons	53		23	
	243	—9.9	252	—10.3

SUMMARY

	1930	%	1931	%
Total number of students	2414		2396	
Clear record	1776	72.9	1756	73.3
Encumbered records	395	16.2	387	16.0
Definitely out	243	9.9	252	10.3
II. AT OTHER SCHOOLS	1930	%	1931	%
Clear record	2,557	65.7	2488	67.2
Conditions	454	11.6	366	9.6
Failures	216	5.5	229	6.2
Conditions and failures	38	0.9	22	0.6
Incomplete	53	1.4	48	1.3
	761	19.4	665	17.7
Must repeat	36	0.9	53	1.4
Failed	145	3.9	86	2.3
Dropped	233	5.9	180	4.9
Withdrew	169	1.9	229	6.2
	583	12.6	548	14.8
Scholarship	46	68		
Illness or finances	12	88		
Other reasons	111	73		
	583	12.6	548	14.8

SUMMARY

	1930	%	1931	%
Total number of students	3901		3701	
Clear record	2557	65.7	2488	67.2
Encumbered record	761	19.4	665	17.7
Definitely out	583	14.8	548	14.8

TABLE 3—COMPARISON OF ENTRANCE CREDENTIALS WITH ACCOMPLISHMENT
(1931)

Credentials	Clear	Conditions	Failures	Conditions & Failures	Incomplete	Must repeat	Failed	Dropped	Withdrew			Total
									Scholarship	Illness or Finances	Other Reasons	
1 year	1											1
2 years	309	117	61	11	21	14	36	71	22	25	34	1221
2 years plus	22	2	1		1		1	2	2	2	1	34
3 years	1126	159	66	10	41	34	27	69	21	34	21	1620
3 years plus	29	6	1	1	1	2	1	2	3	1		47
4 years or more	106	20	16		3	2	11	10	6	5	1	180
A. B.	1236	126	87	5	45	17	35	66	14	25	22	1676
B. S.	800	136	77	6	9	10	23	45	17	36	15	1174
Ph. G. & Ph. C.	37	6	2				2	1	1	2	1	52
Other degrees	68	7	6		2	2	1	3	1	2	1	93

TABLE 4—COMPARISON OF ENTRANCE CREDENTIALS WITH ACCOMPLISHMENT BY PERCENTAGES (1931)

	Clear %	Encumbered %	Out %
1 year	1—100		
2 years	809—65.4	210—17.2	202—16.6
2 years plus	22—64.7	4—11.7	8—23.5
3 years	1126—69.6	276—16.9	206—12.8
3 years plus	29—61.7	9—19.2	9—19.2
4 years or more	106—58.9	39—21.7	35—19.4
A. B.	1336—73.7	263—15.6	179—10.7
B. S.	664—68.2	228—18.5	146—12.4
Other degrees	68—73.1	15—16.1	10—10.8
Ph. G and Ph. C.	37—71.1	8—15.4	7—13.5

SUMMARY

	Clear %	Encumbered %	Out %
No degree	67.4	17.3	14.8
Degree	71.5	17.1	11.4

TABLE 5—COMPARISON OF ENTRANCE CREDENTIALS WITH ACCOMPLISHMENT BY PERCENTAGES (1930 AND 1931)

	Clear 1930-1931	Encumbered 1930-1931	Out 1930-1931
1 year	71.4—100	14.2—	14.2—
2 years	67.7—65.4	17.6—17.2	14.7—16.6
2 years plus	63.6—64.7	17.4—11.7	19.0—23.5
3 years	70.7—69.6	18.6—16.9	11.8—12.8
3 years plus	66.4—61.7	15.7—19.2	17.2—19.2
4 years or more	60.0—58.9	18.2—21.7	21.7—19.4
A. B.	75.3—73.7	13.5—15.6	11.0—10.7
B. S.	69.4—68.2	17.6—18.5	12.9—12.4
Other degrees	78.0—73.1	13.3—16.1	8.5—10.8
Ph. G. & Ph. C.	71.1	15.4	13.5

SUMMARY

	Clear 1930-1931	Encumbered 1930-1931	Out 1930-1931
No degree	68.0—67.4	18.0—17.3	14.0—14.8
Degree	73.1—71.5	15.2—17.1	11.6—11.4

TABLE 6—ENTRANCE CREDENTIALS OF REPEATERS IN 35 MEDICAL SCHOOLS.

2 years	29
3 years	28
4 years	1
5 years	1
A. B.	39
B. S.	34
Ph. G.	1

TABLE 7—ACCOMPLISHMENT OF REPEATERS.

Total number	133
Clear	71.7%
Encumbered	19.9%
Out	8.4%

TABLE 8—PERFORMANCE OF WOMEN STUDENTS.

Total number	271
Clear	191—70.4%
Conditions	25— 9.2
Failures	7— 2.6
Conditions and failures	2— 0.7
Incomplete	9— 3.3
	43—15.8
Must repeat	5— 1.8
Failed	4— 1.4
Dropped	11— 4.0
Withdrew	17— 6.2
Scholarship	2
Illness or Finances	7
Other reasons	8
	37—13.4
SUMMARY	
Clear record	70.4
Encumbered	15.8
Out	13.4

TABLE 9—COMPARISON OF WOMEN STUDENTS' ACCOMPLISHMENT IN OWN AND IN OTHER MEDICAL SCHOOLS.

Total number women students	271
In own medical school	90
In other medical schools	181
I. IN OWN SCHOOL	%
Clear record	64—71.1
Conditions	10—11.1
Failures	1— 1.1
Conditions and failures	1— 1.1
Incomplete	3— 3.3
	15—16.6
Must repeat	2— 2.2
Failed	—
Dropped	3— 3.3
Withdrew	6— 6.6
Scholarship	0
Illness or finances	3
Other reasons	3
	11—12.1

II. IN OTHER MEDICAL SCHOOLS		%
Clear record	127	70.2
Failures	6	3.3
Conditions and failures	1	0.6
Incomplete	6	3.3
		28—15.5
Must repeat	3	1.6
Failed	4	2.2
Dropped	8	4.4
Withdrew	11	6.1
Scholarship	2	
Illness or finances	4	
Other reasons	5	
		26—14.3

SUMMARY

	Own School	Other Schools
Clear record	71.1%	70.2%
Encumbered record	16.6%	15.5%
Out	12.1%	14.3%

TABLE 10—DATA ON APPROVED AND NONAPPROVED COLLEGES.

	1930	1931
Total number colleges sending students into medical schools.....	581	612
Approved colleges	448	506
Nonapproved colleges	133	124
Total number of students	6,315	6,097
From approved colleges	5,876	5,743
From nonapproved colleges	439	354

TABLE 11—(A) ACCOMPLISHMENT OF STUDENTS FROM APPROVED COLLEGES.

	1930	%	1931	%
Total number of students	5876	93.0	5743	94.2
Clear record	4076	69.2	4031	70.4
Conditions	618	10.5	542	9.3
Failures	278	4.7	292	5.0
Conditions and failures	59	1.0	29	0.5
Incompleted work	104	1.7	118	2.0
Must repeat	52	0.8	75	1.3
Failed	178	3.0	118	2.1
Dropped	301	5.1	245	4.3
Withdrew	210	3.5	293	5.1

(B) ACCOMPLISHMENT OF STUDENTS FROM NON-APPROVED COLLEGES.

	1930	%	1931	%
Total number of students.....	439	7.0	354	5.8
Clear record	247	56.2	214	60.4
Conditions	76	17.3	37	10.4
Failures	21	4.8	25	7.0
Conditions and failures	2	0.4	4	1.1
Incompleted work	8	1.8	5	1.4
Must repeat	4	0.8	6	1.7
Failed	24	5.4	19	5.3
Dropped	33	7.5	24	6.7
Withdrew	24	5.4	20	5.6

TABLE 12—ACCOMPLISHMENT OF 1931 FRESHMAN CLASS IN 76 MEDICAL SCHOOLS.

Legend: Cl—Clear. C—Conditions. F—Failures. CF—Conditions and failures. I—Incomplete. Rep.—Must repeat. Fd—Failed. Dr—Dropped. Withdrew: S—Scholarship. I-F—Illness or finances. OR—Other reasons.

School	Total	Cl	C	F	CF	I	Rep	Fd	Dr	Withdrew			
										S	I-F	OR	
Alabama	56	34	10						9		1	2	
Arkansas	50	22	11					8	3		2	4	
Medical Evangelists	114	83	11	9	3	2	1	3	1	1			
California	61	46	14								1		
Southern California	54	45						7			1	1	
Stanford	51	44	2	1		4							
Colorado	60	34	4	1			7		8		4	2	
Yale	55	53											2
Georgetown	156	138	14						4				
George Washington.....	90	73	2						11			4	
Howard	66	45	13	1	1	1		3				2	
Emory	61	37	4	2	1	1	3		3	5		5	
Georgia	40	26	12									2	
Loyola	149	95	1	8	1	4		1	14			25	
Northwestern	123	108	7	6		2							
Chicago	81	66		8		3					1	3	
Illinois	183	106		36					25	1	3	11	
Indiana	121	104				1		13			1		
Iowa	87	60	6	1					14		5	1	
Kansas	80	49		15		9		4			3		
Louisiana	48	21		10				3	4	10			
Tulane	123	47	52			3	4		7		5	5	
Louisville	92	54		14			5		6	6	6	1	
Johns Hopkins	70	69									1		
Maryland	114	81	18			1	1		12		1		
Boston	69	58		4		2			2		1	2	
Harvard	125	125											
Tufts	124	94		22					6		2		
Detroit	102	70	12	1	1	1	6	6		1	4		
Michigan	128	82	23	1	4	8	7		1		2		
Minnesota	94	69					9	16					

TABLE 12—Continued.

School	Total	Cl	C	F	CF	I	Rep	Fd	Dr	Withdrew		
										S	I-F	OR
Mississippi	26	23	3									
St. Louis	162	95	32			1	2	4	16	2	7	3
Missouri	45	30	6	4					5			
Washington	78	66	6						4		1	1
Creighton	97	61	11	4	1		3	5	2	2	6	2
Nebraska	98	78	1	3			1			8	4	3
Dartmouth	17	13	3						1			
Albany	39	18	17						3		1	
Columbia	115	94	12			3			2	1	3	
Cornell	69	66				1					1	1
Long Island	113	63		36					11	2	1	
New York Homeopathic	86	44	22	1			1	2	15		1	
Syracuse	53	46		5			1					1
New York University	140	95	29			2	1		5		6	2
Buffalo	81	59	10			1			9	1	1	
Rochester	50	45	1			1			2		1	
Duke	64	52		6		1				4		1
North Carolina	37	27	7							1	2	
Wake Forest	31	23	6	1			1					
North Dakota	29	27									2	
Ohio	99	61	5	10	3	1		1	16		1	1
Cincinnati	90	65	12	1					6		6	
Western Reserve	78	62	8			1	4			1		2
Oklahoma	69	48	6	3	2		2		5		2	1
Oregon	65	43	6	1		2			11			2
Hahnemann	140	82	37					2	2	5	11	1
Jefferson	156	120	17			1		18				
Temple	115	87	26			2						
Pennsylvania	120	80		24		3		1	2			
Pittsburgh	67	63		1							2	1
Woman's	51	37	1			2	2	1	3	1	3	1
South Carolina	41	29	10					1			1	
South Dakota	21	15	1						1	1		3
Meharry	58	33		19					1		2	3
Vanderbilt	50	45		3								2
Tennessee	91	45	13	8	1		6	8		5	3	2
Baylor	120	53	17	8	2			29		6	4	1
Texas	101	64	18			3			6		3	7
Utah	34	23	5			1		2			2	
Vermont	43	30		5		1			5		2	
Virginia	69	36	14	4	2		4		5			4
Medical College of Virginia ..	86	62	8	1	1		2		8		2	2
West Virginia	78	48	4	9				16			2	
Marquette	75	66		1					8			
Wisconsin	104	38	6			41	8	1	2		6	2

TABLE 13—ACCOMPLISHMENT OF 1931 FRESHMAN CLASS.
First Line—Own University Students.

Second Line—Students from Other Universities.

Legend: Cl—Clear. C—Conditions. F—Failures. CF—Conditions and failures. I—Incomplete. Rep.—Must repeat. Fd—Failed. Dr—Dropped. Withdrew: S—Scholarship. I-F—Illness or finances. OR—Other reasons.

School	Total	Cl	C	F	CF	I	Rep	Fd	Dr	Withdrew S I-F OR
Alabama	37	21	7					7		1 1
	19	13	3					2		1
Arkansas	15	9	3				1		1	1
	35	13	8				7		2	2 3
Medical Evangelists	114	83	11	9	3	2	1	3	1	1
Stanford University	31	26	2	1		2				
	20	18				2				
California	51	37	13							1
	10	9	1							
Southern California	19	14						3		1
	35	31						4		
Colorado	26	14	2	1			3		4	1 1
	34	20	2				4		4	3 1
Yale	19	18								1
	36	35								1
George Washington	48	35	2						11	
	42	36	1						5	
Georgetown	23	24	3						1	
	128	114	11						3	
Howard	33	24	4	1	1			1		2
	33	21	9			1		2		
Georgia	20	14	6							
	20	12	6							2
Emory	37	29	2		1	1	1			1 2
	24	8	2	2			2	3	4	3
Northwestern	41	36	2	2		1				
	82	72	5	4		1				
Illinois	47	27		2					6	1 1
	136	79		24		1			19	1 2 10
Loyola	33	22		1	1	1			4	4
	116	73	1	7		3		7	10	21
Chicago	25	22		1		1				1
	56	44		7		2				1
Indiana	38	74				3		10		1
	33	30						3		
Iowa	48	35	2						8	3
	39	25	4	1					6	2
Kansas	50	32		11		4				3
	30	17		4		5		4		
Louisville	36	26		5			2			1 2
	56	28		9			3		6	5 5
Tulane	43	18	17			2	1		3	1 1
	80	29	35			1	3		4	4
Johns Hopkins	9	9								
	61	60								1
Maryland	43	31	8						4	
	71	50	10			1	1		8	1

1
3

$$\begin{array}{r} 1 \\ 10 \\ \hline 4 \\ 21 \end{array}$$

School	TABLE 13—Continued.						I	Rep	Fd	Dr	Withdrew			
	Total	Cl	C	F	CF						S	I-F	OR	
Cincinnati	47	33	6							5		3		
	43	32	6	1						1		3		
Western Reserve	26	23	2				1							
	52	39	6					4			1		2	
Ohio	66	46	2	7						9		1	1	
	33	15	3	3	3	1			1	7				
Oklahoma	41	29	4	1	1			1		3		1	1	
	28	19	2	2	1			1		2		1		
Oregon	31	20	3							7			1	
	34	23	3	1		2				4			1	
Pennsylvania	37	32		2		2			1					
	83	48		22		1				2				
Woman's														
	51	37	1				2	2	1	3	1	3	1	
Jefferson														
	156	120	17				1		18					
Hahnemann	9	6	3											
	131	26	34						2	3	5	11	1	
Pittsburgh	47	45										1	1	
	20	18		1								1		
Temple	42	38	2			2								
	73	49	24											
South Carolina	25	18	7											
	16	11	3						1			1		
South Dakota	5	3	1								1			
	16	12								1			3	
Vanderbilt	24	23		1										
	26	22		2									2	
Meharry														
	58	33		18						1	1	2	3	
Tennessee	47	25	4	4	1			6	2		2	1	2	
	44	20	9	4					6		3	2		
Baylor	23	13	3	2	1				4					
	97	40	14	6	1				25		6	4	1	
Texas	52	38	11				1			2				
	49	26	7				2			4		3	7	
Utah	29	19	5				2		1			2		
	5	4							1					
Vermont	28	18		5						3		2		
	15	12					1			2				
Virginia	40	19	10	1	1			3		2			4	
	29	17	4	3	1			1		3				
Medical College of Virginia..														
	86	62	8	1	1			2		8		2	2	
Wisconsin	80	28	5				36	4	1	1		4	1	
	24	10	1				5	4		1		2	1	
Marquette	47	43		1						3				
	28	23								5				
West Virginia	43	33	1	9								1		
	35	3	1						16			1		
Louisiana	8	4		1					2		2			
	40	17		9					2	4	8			

TABLE 14—ACCOMPLISHMENT OF 1931 FRESHMAN CLASS.

First Line—Own Students in Own Medical School.

Second Line—Own Students in Other Medical Schools.

Legend: Cl—Clear. C—Conditions. F—Failures. CF—Conditions and failures. I—Incomplete. Rep—Must repeat. Fd—Failed. Dr—Dropped. Withdrew: S—Scholarship. I-F—Illness or finances. OR—Other reasons.

School	Total	Cl	C	F	CF	I	Rep	Fd	Dr	Withdrew			
										S	I-F	OR	
Alabama	37	21	7					7		1	1		
	40	20	6	3			1	3	5	1	1		
Arkansas	15	9	3				1		1				1
	11	10		1									
Stanford	31	26	2	1		2							
	27	25	1			1							
California	51	37	13									1	
	51	3				1	1	2					1
Southern California	19	14						3		1			1
	24	20		1	1	1		1					
Colorado	26	14	2	1			3		4		1	1	
	1	1											
Yale	19	18											1
	46	42		1		1					2		
George Washington	48	35	2						11				
	15	8	4	1					1				1
Georgetown	28	24	3						1				
	12	6		2	1			2					1
Howard	33	24	4	1	1			1					2
	7	4		3									
Georgia	20	14	6										
	11	4	1				1	2		2			1
Emory	37	29	2		1	1	1			1	2		
	14	7	5	1					1				
Northwestern	41	36	2	2		1							
	31	19	1	3		1			5				1
Illinois	47	27		2					6		1	1	
	24	20		2		1			1				
Loyola	33	22		1	1	1			4				4
	6	3		1					2				
Chicago	25	22		1		1						1	
	24	21		2		1							
Indiana	88	74				3		10			1		
	12	8						1	2	1			
Iowa	48	35	2						8		3		
	11	8		1				1		1			
Kansas	50	32		11		4					3		
	14	10						1	1	1	1		
Louisville	36	26		5			2			1	2		
	5	2					2		2				
Tulane	43	18	17			2	1		3	1		1	
	7	1		2			1			2		1	
Louisiana	8	4		1				2		2			
	3	2								1			
Johns Hopkins	9	9											
	16	10	4			1			1				

TABLE 14—Continued.

School	Total	Cl	C	F	CF	I	Rep	Fd	Dr	Withdrawn		
										S	I-F	OR
Cincinnati	47	33	6						5		3	
	6	3							2			1
Western Reserve	26	23	2			1						
	17	11	2		1	1			1	1		
Ohio	66	46	2	7					9		1	1
	37	27	6	2					1	1		
Oklahoma	41	29	4	1	1		1		2		1	
	14	6	1	1	1	1		2			2	
Oregon	31	20	3						7			
	6	2	2	1				1				
Pennsylvania	37	32		2		2		1				
	61	44	11	3				1	1		1	
Hahnemann	9	6	3									
	10	6	3						1			
Pittsburgh	47	45									1	1
	65	43	13	1		1		3	2		2	
Temple	42	38	2			2						
	11	8	2	1								
South Carolina	25	18	7									
	4	2									2	
South Dakota	5	3	1							1		
	2	1								1		
Vanderbilt	24	23		1								
	13	9	1				1	1				1
Tennessee	47	25	4	4	1		6	2		2	1	
	4	2	1				1				1	
Baylor	23	13	3	2	1			4				
	6	1							1			1
Texas	52	38	11			1			2			
	30	13	4		2			5		2	2	2
Utah	29	19	5			2		1				
	9	8	1									
Vermont	28	18		5					3		2	
Virginia	40	19	10	1	1		3		2			4
	10	7	2	1								
Wisconsin	80	28	5			36	4	1	1		4	1
	21	16		1	1				1		1	1
Marquette	47	43		1					3			
	2	1					1					
West Virginia	43	33	1	9							1	
	15	10	3	1				1				

Undergraduate Teaching in Orthopedic Surgery*

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Within a comparatively few years the specialty of orthopedic surgery has attained its majority and outgrown its name. Today, it confines itself not to an age period but to a division of the body. Hence, the problems presented in a discussion of its further progress and its educational requirements are those of this anatomic division and therefore of concern to both general and industrial surgeons.

The prevention of disease and disability is admittedly the highest achievement of medical science. This is nowhere more nearly possible of accomplishment than in the field of acquired deformities. The affections in which deformity is likely to be a complication are well known; the physiologic and mechanical laws which determine its type are thoroughly understood; and the measures required for its prevention have nearly all been available for many years; nor is any unusual knowledge or skill required in their application. Yet, despite all this, the steady stream of those crippled by contractures following injuries to the soft tissues, by unreduced fractures in and around joints, and by the various forms of joint disease still continues to pour into our hospitals. It is a reproach to our profession and to our system of medical education that such a situation is permitted to exist.

If the physician is to recognize the presence or anticipate the development of deformity and disability, he not only must have a working knowledge of the diagnostic methods necessary for their detection but must be acquainted with the fundamental principles in their causation. He needs to be deformity conscious, or, as Goldthwaite taught the young medical officers of the A. E. F., he must learn to "think in terms of function." Yet, it is in these very things that he is deficient. The number of our profession who are able to make a satisfactory examination of the extremities and the spine is distressingly small, nor is the number of those who have an adequate understanding of the basic factors in the production of deformity any greater. Long observation of hospital interns shows an improvement in skill, from year to year, in the physical diagnosis of the chest and the abdomen but a continued ignorance in that of the spine and the extremities, and this applies to all

*Being part of a paper on "The Future of Orthopedic Surgery; with Especial Reference to Teaching," read before the American Orthopedic Association, at its Forty-sixth Annual Session, held at Toronto, Canada, June 15-18, 1932.

without regard to the school from which they have graduated. Clearly, this is not because instruction in the latter is not given but rather because, for reasons to be mentioned later, the student fails to assimilate it.

The problem, therefore, is chiefly and fundamentally one of medical education, which is still far from possessing the well rounded and coordinated character necessary for the training of good general practitioners. Too much instruction is being given in some subjects and too little in others; moreover, insufficient attention is being paid to the interrelation of the various subjects, with the result that the student is bewildered by the enormous number of seemingly unrelated facts. The affections of the spine and the extremities not only constitute a considerable proportion of man's ills, but with industry dominating our civilization as it does today, they have become of great economic importance and demand more intelligent consideration than they are receiving. Surely it is not without significance that the so-called irregular cults are thriving mainly on the affections of these regions. Nor can we deny that their use of massage and manipulation is more rational than the senseless drug therapy still prescribed by a considerable number of regular practitioners. However much we may dislike to admit it, the simple truth is that the success of these cults is built very largely on this failure of our own profession.

Since it is the predominance of the mechanical factor in etiology which is the distinguishing feature of the derangements of this entire anatomical division, the student must be taught from the beginning of his medical course the conception of man's body as a machine, whose reactions to mechanical laws are just as important as the reactions of the tissues to pathologic processes. A firmer foundation for our later teaching must be laid in the preclinical branches. Thus, in anatomy more attention must be given to the joints: the student should be shown how their anatomic peculiarities determine the prevailing lesion, as, for example, is so well illustrated in the shoulder, the lumbosacral region and the knee; he should learn what joints have fibrocartilages and their influence on joint derangement, in which joints the epiphyses lie inside the capsule and the significance of this location in acute osteomyelitis, what tendons are liable to displacement, and so on.

In physiology, more time should be devoted to gait and posture, to the mechanism of respiration and its effect on posture, to muscle tone and muscle balance and their influence in joint strain and in deformity.

In pathology the affections of the bones and joints should receive the same careful consideration as those of the chest and the abdomen. These changes can be brought about only by our cooperation with the pre-

clinical teachers in outlining the essentials to be covered in the various branches.

In order to assure the student a working knowledge of the physical examination of the spine and the extremities, a change in the time and the method of teaching the subject is necessary. Although it is obvious that facility in this art, as practiced in orthopedic surgery, is essential in the diagnosis of all surgical affections of these parts, this instruction is left almost entirely to the orthopedic surgeon and so is usually not given until the second half of the third or the first half of the fourth year. This is too late for the student to appreciate its importance. The time available for instruction is too short to permit sufficient training in the diagnostic details, and the many opportunities in earlier clinical work for their practice is lost. Finally, the instructor is handicapped from the beginning by the fact that the student seems unable to free his mind of the idea that he is being taught a specialty.

This misconception is peculiarly troublesome in all general instruction by specialists; as Allison¹ pointed out more than ten years ago, "all too often the medical student gains the impression that because a certain type of lesion or disease is treated in a special clinic, this lesion or disease belongs, by a sort of divine right, to a specialist." The correction of these deficiencies can be brought about only, it seems clear, by giving the course earlier and classifying it as a general one, although undoubtedly the instructors must be men with orthopedic training.

Beginning with the first semester of the second year, at the time the student receives his instruction in the physical examination of the chest and the abdomen, he should be given a similarly comprehensive course in the examination of the spine and the extremities. That the spine should receive particularly careful consideration in such a course is demanded by the lack of knowledge of our profession of the technic of spinal examination and the emphasis laid on the etiologic importance of spinal derangements by the irregular cults. The diagnostic methods taught should be acceptable to all the surgical groups interested, and should be made available in book form, so that the same methods will be taught by the instructors and practiced by the students throughout the clinical years. In a paper, read before this Association in 1927, Rogers² expressed his belief that the examination of joints "should be made a part of the course in physical diagnosis which is commonly given in the second year," and a beginning, at least, has been made at Harvard. Today changes in the plan of medical instruction are not brought about readily, if at all, by individual effort but require the authoritative action

1. Allison, Nathaniel: J. Orth. Surg. N.S. 3:448-459, 1921.

2. Rogers, Mark H.: J. Bone & Joint Surg. N.S. 9:421-426, 1927.

of recognized groups. If this change is as vital to the successful teaching of orthopedic surgery as some of us believe it is, it clearly justifies action by our Association.

A second subject which presents similar aspects, both as regards its general importance and its requirements in teaching, is the principles of immobilization and how these are met by the standard splints and other appliances. This may be touched on in the course on bandaging, when such a one is given, and is partially treated in the one on fractures but for the rest is left to the course in orthopedic surgery. The early presentation of this subject, also as a general one but taught, at least in a large part, by men with orthopedic training, could not prove otherwise than helpful in the student's early clinical work and as a foundation in his later orthopedic instruction. In this course the emphasis should be laid chiefly on principles; far too commonly the student carries away only the remembrance that in a given affection his instructor uses a certain splint or type of cast or other appliance, rather than the understanding of the problems presented by the various regions and the varying severity of the pathologic process.

In the past the attitude of the teacher of orthopedic surgery has been almost purely a passive one: gratified, perhaps, by having his specialty accorded a place in the curriculum, he has accepted the student as he found him and simply endeavored to teach as much of the subject as seemed to him desirable. The time has now come when his rôle must be an active one: he must take an interest in the curriculum as a whole if he expects the student to receive sufficient early training to enable him to comprehend the mechanical and the physiological aspects of later orthopedic instruction.

As to what undergraduate instruction in orthopedic surgery should include, the problems of the spine and the extremities of importance in general practice is probably a broad enough definition to be acceptable to the majority; but when the attempt is made to specify just what these problems are, divergence of opinion is certain to be encountered. Granted, that the chief function of the physician from the orthopedic standpoint is the prevention of deformity and disability, and that to accomplish this he must become deformity conscious and learn to "think in terms of function," then it is evident that much more attention must be given in undergraduate teaching to the fundamental factors in the production of deformity and disability. The nature, causes and manner of development of deformity and disability should be gone into thoroughly, special emphasis being laid on the action of mechanical laws. It is the lack of this fundamental knowledge which makes orthopedic surgery such a con-

fused subject to both student and physician. Much that is now taught about special diseases can safely be left until the fifth, or hospital, year. Osgood and Allison's interesting and suggestive Harvard Lectures³ certainly come the nearest to meeting the undergraduate's requirements of anything that has, as yet, been presented. Our excellent American textbooks on orthopedic surgery are more adapted to the needs of the physician than to those of the student. From the standpoint of the student, it is unfortunate that they fail to present these essential fundamental matters in a special section but scatter the references to them throughout the text. How many students today have the time and the enthusiasm to read six or eight hundred pages in order to acquire this knowledge? Yet, to attempt to prevent deformity or to correct it when present, without a clear understanding of the basic factors which produce it, is like trying to read a foreign language without a vocabulary.

Naturally, a powerful influence is exerted on medical education by the National and State Boards of Medical Examiners through their choice of questions. Their assistance should be sought by our Association in emphasizing the particular features of orthopedic undergraduate instruction which our Association may decide are desirable.

³ J. Osgood and Allison: *Fundamentals of Orthopedic Surgery in General Medicine and Surgery*, Macmillan & Co., 1922.

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*Licensure of Graduates of Foreign
Medical Schools*

In harmony with the regulations adopted by the Federation of State Medical Boards of the United States, the New York State Education Department announces that in the case of American or European medical students matriculating on or after March 1, 1933, a course of study in a European medical school will not be accepted as meeting the professional requirement for admission to the New York medical licensing examination if the applicant has not:

(a) Had, prior to beginning the first year of medical study, the preliminary general education required by the rules of the New York Education Department—namely, the satisfactory completion of a two years' course of study in a registered college of liberal arts and science, or its equivalent as determined by the commissioner. The two years of study shall include English, six semester hours; physics, six semester hours; biology, six semester hours; chemistry, twelve semester hours, including an approved course in organic chemistry; and

(b) Graduated from a European medical school after the completion of not less than four satisfactory courses of not less than eight months each, including the passing of the examination and the completion of the internship leading to and requisite for the license to practice medicine in the country where such medical school is located.

The National Board of Medical Examiners has adopted the following rule with regard to the acceptance of students trained in European medical schools:

That no student, either American or European, matriculating in a European medical school subsequent to the academic year 1932-1933 will be admitted to the examination of the National Board of Medical Examiners who does not present satisfactory evidence of premedical education equivalent to the requirements of the Association of American Medical Colleges and the Council on Medical Education and Hospitals of the American Medical Association, and graduate from a European medical school after a medical course of at least four academic years, and obtain a license to practice medicine in the country in which the medical school from which he graduated is located.

♦ ♦

*Regulations for Registration of
Americans in Bavarian Medical
Schools*

It is reported that the Bavarian government has issued a ruling which will make it impossible for any American to enter on the study of medicine in the Universities of Munich, Erlangen and Wuerzburg, unless he can furnish irrefutable evidence that he has already secured admission to an American medical school. Under former rulings, it was only necessary to have met the minimum requirements for admission to an American medical school. The new ruling requires actual acceptance by an American school.

♦ ♦

*Regulation for Admission of Americans to the University of Zurich,
Switzerland*

The rector of the University of Zurich, Switzerland, recently notified the

American Consul General in Zurich of the entrance requirements for American medical students which have been in force since the Fall of 1932.

1. An A.B. or B.S. diploma from a university or college recognized by the Association of American Universities.

2. Presentation of the transcript of records, only such students who have received the ratings of A and B, or, at least, 80 points, being acceptable.

3. A certificate as to a sufficient knowledge of the German language.

4. A declaration that the student has not been refused admission to a recognized American university.

♦ ♦

Study of Medicine in Austria

According to advices received from the Medical Faculty of the University of Vienna, there does not exist in Austria an actual license to practice medicine, the conducting of the medical practice depending on the possession of the doctor's diploma of an Austrian University and the proof of the Austrian citizenship.

Foreign students in Austria, on termination of their study—which is the same as for Austrians—receive the same doctor's diploma as Austrians do, with the exception that on diplomas given to foreign students a stamp is being affixed stating that without the proof of the Austrian citizenship the student is not allowed to practice in Austria.

♦ ♦

Forged Credentials

A former student of the University of Missouri by the name of Walter Frederick Richelman, present address 1190 West 36th Street, Los Angeles, California, presented forged credentials from Red Wing Seminary, Red Wing, Minnesota, and Washington University in St. Louis. It has come to light that these credentials were forged. At the present time Richelman is a premedical student

in the University of Southern California. He will not be readmitted to the university after the close of this semester.

The Tulane University of Louisiana School of Medicine reports that Daniel Gay Martindale, of Tiplersville, Mississippi, now attending the University of Alabama, attempted to gain admission to the freshman class by the presentation of fraudulent credentials purporting to have been issued by Union University. He was allowed to withdraw from Union University because he tampered with the records in the registrar's office. In some way he had secured his permanent record card and added to it many courses that he had never pursued. On the basis of this altered record he had gained admission to the University of Alabama.

♦ ♦

Errata

In the report on the study of applicants for admission to medical schools in 1932, published in the March issue of the JOURNAL, an error appears on page 75 in the paragraph beginning, "In Table 5 is presented the summary," etc. In lines 4, 5 and 6, the word "rejected" should be "accepted," and in line 7 the word "rejections" should read "acceptances." Please refer to Table 6 for details.

♦ ♦

Limitation of Graduates in Medicine

The secretaries of the county medical societies of Georgia have been asked to present a resolution requesting all state medical societies, the Southern Medical Association and the American Medical Association to adopt resolutions requesting the medical colleges of the United States to reduce the number of graduates each year until the law of supply and demand has been complied with fully. The number of graduates is to be determined by a national committee appointed by the president of the American Medical Association.

College News

New York University, University and Bellevue Hospital Medical College

Following recent meetings of the Council of New York University, the ensuing changes and appointments have been announced:

The previous Department of Bacteriology and Hygiene has been divided into the two Departments of Bacteriology and Preventive Medicine. This was made possible by the endowment of the Hermann M. Biggs Professorship of Preventive Medicine and was followed by the appointment of Dr. William H. Park to the new chair. Dr. K. George Falk has been appointed Professor of Chemical Bacteriology in Preventive Medicine.

The previous Department of Therapeutics has been brought into the Department of Medicine but with a separate endowed chair named in honor of former Dean Samuel A. Brown. Dr. Arthur C. DeGraff has been appointed the first Samuel A. Brown Professor of Therapeutics.

♦ ♦

Stanford University School of Medicine

Henry G. Mehrtens, acting dean, died February 28, from heart disease aggravated by an attack of influenza. Dr. Mehrtens served as dean only a short time but had been a member of the faculty for nearly 20 years. He is succeeded as acting dean by Dr. A. L. Bloomfield, of San Francisco.

♦ ♦

University of Kansas School of Medicine

The third course of lectures under the Porter Lectureship in Medicine was delivered by Dr. J. Shelton Horsley of Richmond, Virginia, March 28 and 29.

The subject of these lectures was indigestion and cancer of the stomach.

In 1918, Dr. J. L. Porter of Paola, Kansas, bequeathed to the School of Medicine of the University of Kansas, a sum of money for the stimulation of scholarship and research in the Medical School. A portion of the income from this fund has been used to provide a scholarship for a worthy student. The remainder of the income is to be used to defray the expenses of an annual lecturer in medicine.

♦ ♦

Medical College of Virginia

The participants in the Stuart McGuire Lectureship series at the Medical College of Virginia, Richmond, April 25-27, 1933, were Dr. Ronald T. Grant, Department of Clinical Research, University College Hospital Medical School, London, who gave three lectures on the pathology of endocarditis, and another lecture on the arteriovenous anastomoses in human skin; Dr. Louis Hamman, Johns Hopkins University, who gave a clinico-pathological conference; Dr. Tinsley Harrison, Vanderbilt University, who lectured on cardiac dyspnea; and Dr. Paul White, Harvard University, who held a clinic.

♦ ♦

Western Reserve University School of Medicine

Leave has been granted to Dr. James Angus Doull, professor of hygiene and public health, to organize an epidemiological study for the Leonard Wood Memorial for the Eradication of Leprosy. Dr. Doull will be absent from Cleveland for about six months. He will organize studies in the frequency

of leprosy in relation to diet, age, living conditions of the island people, known contact with previous cases and other factors. These and similar studies will be continued over some years in the Philippines and possibly in other parts of the world. The Leonard Wood Memorial honors the memory of General Leonard Wood, who as Governor-General of the Philippine Islands was deeply interested in the welfare of the people.

♦ ♦

Indiana University School of Medicine

A new course in medical economics and medical ethics was given to the senior class this semester. The purposes and content of this course were approved by the Indiana State Medical Association, which has appointed a committee, composed of Dr. George J. Geisler, South Bend; Dr. Cyrus Clark, Indianapolis, and Dr. G. D. Scott, Sullivan, to cooperate with the faculty of the medical school in giving the course.

♦ ♦

Johns Hopkins University School of Medicine

The sixth annual course of lectures under the William Sydney Thayer and Susan Read Thayer Lectureship in clinical medicine was given by Dr. Theobald Smith, April 5, 6 and 7. His subjects were: "A Comparative Study of Focal Cell Reactions in Tuberculosis and Allied Diseases," and "Undulant Fever."

The ninth course of lectures on the Charles E. Dohme Memorial Lectureship was given April 20-22 by Sir Henry H. Dale, director of the National Institute for Medical Research of London, England. The general subject discussed was "Progress in Autopharmacology," and consisted of a survey of present knowledge of the chemical regulation of certain functions by natural constituents of the tissues, namely, histamine, acetylcholine, adenosine and kallikrein.

University of Virginia Department of Medicine

March 6, Dr. Bruce Morton addressed the Roanoke Academy of Medicine on "End Results of Treatment of Peptic Ulcer."

Dr. Edwin P. Lehman served as Visiting Professor of Surgery at the Emory Medical College from March 13 to 14.

February 14, Dr. J. Edwin Wood addressed the County Medical Society in Danville, Virginia, on the subject of "Clinical Detection and Management of the Cardio-Vascular Irregularities."

March 20, Dr. Walter B. Cannon, professor of physiology in Harvard Medical School, gave a lecture on his recent experimental work which led to his discovery of Sympathin.

♦ ♦

University of Cincinnati College of Medicine

The Alfred M. Stern Scholarship in Psychiatry established two years ago with an annual stipend of \$1,500 has now become the Alfred M. Stern professorship. Through the generosity of Mrs. Seasongood, mother of ex-Mayor Seasongood of Cincinnati, a like amount has been added to the fund for the purpose. Both gifts are to continue for a period of four years.

♦ ♦

University of Toronto Faculty of Medicine

The Seventh Annual Donald C. Balfour lecture in surgery was delivered April 5, by Dr. Alexander Primrose, emeritus professor of clinical surgery, University of Toronto. His subject was "The Interrelation of Anatomy and Surgery." April 5, 1933 is the 106th anniversary of the birth of Lord Lister.

♦ ♦

Tulane University School of Medicine

Five Mississippians have been awarded Commonwealth Fund Scholarships. These scholarships are provided each

year through the School of Medicine of the Tulane University of Louisiana as a part of rural health promotion in Mississippi which the Commonwealth Fund of New York has undertaken under a ten year plan. Students financed by this Commonwealth Fund receive a total of \$1,200 a session, in return for which they agree to practice in the rural sections of their state for at least three years after graduation.

These scholarships go into effect with the opening of the 1933 session in September.

♦ ♦

University of Colorado School of Medicine

NEW FACULTY APPOINTMENTS: George S. Johnson, associate professor of psychiatry and neuropathology; Paul H. Guttman, assistant professor of pathology; Ralph W. Danielson and Maurice E. Marcove, instructors in ophthalmology; Ora L. Huddleston, instructor in physiology and pharmacology, and Enid K. Rutledge, instructor in pathology.

RESIGNATIONS: John B. Davis, associate professor of surgery (urology) and William C. Finnoff, associate professor of ophthalmology, resigned.

Franklin G. Ebaugh, professor of psychiatry and director of the Colorado Psychopathic Hospital, is recovering from a general toxemia following an operation for appendicitis.

♦ ♦

University of California Medical School

Dr. George W. Crile, head of the Cleveland Clinic, Cleveland, Ohio, conducted a clinic for the faculty and students on April 11, 1933.

Dr. J. C. Drummond, professor of biochemistry, University College, University of London, spoke to the faculty and stu-

dents on April 6, 1933. He discussed the general subject of vitamins with some comments on the clinical features of avitaminosis. Dr. Drummond was the Lane lecturer at Stanford University School of Medicine for 1933. Dr. William H. Park, director of the laboratories of the New York Department of Public Health, spoke to the faculty and students on March 18, 1933.

Colonel William R. Dear of the Army Medical Corps spoke at the Medical School in March. His lecture was based on his experience as senior medical officer with the American Russian Relief Mission.

George Sarton, Ph. D., lecturer in Harvard University, Associate of the Carnegie Institution, editor of "isis" and Hitchcock professor in the University of California, January-February, 1933, spoke January 31 on "The Rise and Decline of Arabic Science."

♦ ♦

College of Medical Evangelists

Percy T. Magan, president of the college, was recently appointed a member of the California State Board of Medical Examiners.

It is reported that construction work on the new college hospital will be started in the near future. This will provide additional clinical material as the bed capacity of the present hospital will be increased considerably.

♦ ♦

University of Alabama School of Medicine

Harry Boyer Weiser, professor of chemistry in Rice Institute, Houston, Texas, gave the annual lecture of the Sigma Xi Club of the University of Alabama, March 30. His subject was "Colloidal Phenomena in the Formation of Gallstones."

General News

Special Course in Cardiology

Columbia University School of Medicine and University Extension announces that a group of specially trained physicians of Mount Sinai Hospital proposes to offer a four weeks practical course in all forms of heart disease to physicians in general practice and to internists especially interested in cardiology, beginning June 5 and ending July 1, 1933. The medical service has over 140 beds, a large proportion of which are filled by patients suffering from cardiovascular disorders. An active morning outpatient adult cardiac clinic is in session twice a week, serves an average of 30 patients at each session, and has a case load of 400 patients. In the afternoon there is daily a large general medical outpatient department which also sees many cases of cardiovascular disorders. Similarly the pediatric department has about 50 medical beds, has connected with it an active outpatient cardiac clinic which meets twice a week and sees about 15 children at each session, and has a case load of 300 patients. There is, therefore, an abundant clinical material for a study of cardiovascular disorders in children, adolescents, and adults.

Available for the use of the students are complete laboratories of electrocardiography, roentgenology and pathology.

The practical approach to cardiac disease will be stressed. Physical examination of patients will receive careful attention, particularly the usefulness of inspection, palpation, percussion, and auscultation. Normal anatomy and normal physiology will introduce the subjects of pathological lesions of the heart leading to cardiac failure. Normal and abnormal x-ray findings, the normal electrocardiographic curve and the abnormali-

ties caused by functional and structural changes will be considered. Each student will have the opportunity of learning at first hand the methods of making and interpreting electrocardiograms.

Rheumatic disease in children and adults, arteriosclerotic and coronary disease, hypertensive heart disease, syphilis of the heart, thyroid diseases as related to cardiac disorders, congenital heart disease—the etiology, diagnosis, prognosis and treatment will be considered in each. Illustrative cases will be presented in clinic and ward. Cases will be assigned to the students for work-up and report. The use of acceptable cardiac drugs and other therapeutic aids will be fully outlined.

A limited amount of time will be devoted to lectures, and the attempt will be made to conduct the course so that it will recreate for the student actual office and bedside practice.

Fee, \$100. The course will be given to a minimum of 10 students. Address all communications to Dr. Alan R. Anderson, Secretary of the Administrative Board on Postgraduate Studies in Medicine, 630 West 168th Street, New York.

♦ ♦

Limitation of Medical Students in Iowa

For the purpose of investigating the University of Iowa hospitals, a committee of nine members was recently appointed, three by the Senate, three by the House of Representatives and three by the governor. The preliminary report of this committee, with five physician members, was submitted April 1.

The sole purpose of the committee is stated in the House Joint Resolution to have been to seek the cause or causes for the large number of unprovided for

sick and suffering in the state. However, the committee sought information from many sources, on many and varied topics, such as the number of physicians in Iowa, the need for replacements, the number of medical students and graduates in the University of Iowa School of Medicine, how many physicians are needed to give adequate service, and the need of clinical material for adequate teaching.

The committee concluded and recommended that the State Board of Education should adopt such standards of admission on a competitive basis to the medical school which would keep the student body of the College of Medicine within such limits as would produce for the last two years thereof an average of approximately 75 members for each of said years and also raise the standard of the type of student admitted to and graduated from the college; subject to the same limitations under the existing regulations whereby Iowa residents are preferred.—*J. Iowa St. M. Soc.*, April, 1933.

◆ ◆

Lane Medical Lectures

The twenty-fourth course of these lectures, given under the auspices of Stanford University School of Medicine, was delivered by Mr. J. C. Drummond, professor of biochemistry in University College, University of London, England, on April 3, 4, 5, 6 and 7, 1933, in Lane Hall, San Francisco. The subject of these lectures was the problems of nutrition and nutritional disorders. Professor Drummond also delivered a lecture at Stanford University on "General Survey Lines of Future Progress in Nutritional Research."

◆ ◆

Extracts from President A. Lawrence Lowell's Last Annual Report

The trends in the college have been toward a less vocational objective, a greater correlation of knowledge, a rec-

ognition of the principle of self-education, and stimulation of more vivid intellectual interests.

"Less Vocational" means regarding the purpose of college education less from the standpoint of its direct utility in a future career, and more from that of developing the faculties of the student; building the mind rather than storing it with special knowledge; teaching young men how to think accurately and comprehensively about large subjects, rather than how to use the tools of a restricted field. All this is, of course, a matter of degree about which it is not well to be too dogmatic; yet it expresses a reaction against the idea that all education should be essentially vocational.

"Greater correlation of knowledge" is to some extent the same thing regarded from a different standpoint. If the object is not so much to cram the mind with isolated facts to learn how to use them, the student must be brought to compare them, to discriminate between their relative importance, to verify them, and must try to combine them into a system more or less consistent with itself. "Stimulation of more vivid intellectual interests" is the most important point of all. It has, of course, always been the aim and despair of serious educators; despair, because it is the most difficult of all their problems in the absence of a strong vocational incentive. It is natural for teachers to pay most attention to the industrious and proficient students; and yet, while these usually obtain the greatest benefit, they are not always the ones that need attention most. This is particularly true of young men of superior ability whose intellectual tastes and ambitions have not yet been aroused, who are satisfied with a fair merely passing grade, regarding college life as mainly valuable for other reasons.—*Bull. Amer. Assoc. Univ. Professors*, March, 1933.

Assist the Graduate to Locate Himself

While it is true that individual medical schools in a more or less passive way do what they can to satisfy inquiries from their graduates for openings in medical practice, yet there seems to be a singular lack of organized effort on their part to influence this distribution. It is highly uneconomical and inefficient that the present correlation of physicians with community needs depends so largely on the chance personal contact of medical students and interns with their physician friends in the medical profession. It would appear that administrators of medical schools could be of great service to their own students and graduates and to the different communities of their respective states if they would familiarize themselves with the opportunities for, and needs of, medical practitioners.—*Editorial, Indiana St. M. J., April, 1933.*



The Relation of Teaching to Research

This suggests the further question whether some of the fault may not be with the colleges themselves in that they ask, in most cases, that the candidates recommend to them shall be young men who give promise of research productivity. Moreover it is well recognized by the graduate schools that the rapidity of a teacher's advancement, even in colleges which profess to desire teaching capacity above all things else, is all too often dependent upon the success of his research work.

It is true, of course, that most colleges assert themselves ready to recognize and reward good teaching on the same basis as successful research, or even on a higher basis. But a serious difficulty is found in the fact that success in research gets itself automatically rewarded while successful teaching does not. This is be-

cause advancement in rank and salary so frequently come in the wake of a call to another institution, and such calls nearly always result from the reputation which a teacher gains through his research activities. Success in research, moreover, is self-evident. It gains recognition in scientific periodicals and at the hands of learned societies. Good teaching, even though it be conspicuously good, rarely gets recognition beyond the bounds of the campus.

Accordingly, if good teaching is actually to be put on an equality with research as a basis for advancement in rank and salary, it would seem essential that some well-thought-out means for automatically discovering the really good teacher shall be devised and utilized. Good teaching should not be left to make itself known to a teacher's colleagues, to heads of departments, and to college administrators through casual channels such as the gossip of undergraduates or the chance remarks of alumni. In the judgment of the Committee the setting-up of recognized means for the evaluation of good teaching by each department is an essential first step to the adequate rewarding of good teaching in any institution of higher education.—*BULL. AM. ASSOC. UNIV. PROF., December, 1932.*



Postgraduate Training

The continued education of a physician, if he expects to be scientifically successful, throughout his entire professional life, is synonymous with good medical practice; organized medicine must provide the facilities whereby every physician who wishes to do so may carry on in this regard, to the best of his individual capacity. It is not enough that one, two, or three, in each county society continue in this postgraduate effort, because the degree in which medicine takes its proper place in modern society depends not upon the professional leadership of a few, but rather

it is most intimately bound with the extent to which the rank and file can keep abreast of an ever increasing medical knowledge. In a large part, the program for postgraduate instruction, in so far as it is practical, should be carried to the practicing physician in his community.—*Editorial, Indiana St. M. J.*, April, 1933.

♦ ♦

Training Rural Physicians

Thirty-two picked undergraduates in the medical schools of Tufts College, Vanderbilt, and Tulane were given scholarships in 1932 to enable them to prepare for rural practice. At Tufts, Tulane, and Vanderbilt the teaching of preventive medicine has been strengthened. Forty-five physicians from small towns in Massachusetts, Tennessee, and Mississippi were sent to medical centers for post-

graduate study. Thirty-six clinical institutes were held in small towns at which prominent physicians and surgeons from teaching centers lectured to the local medical society and discussed cases with local physicians. In Virginia the Fund made it possible for the state medical society and two medical colleges to provide joint field training in obstetrics.—*Commonwealth Fund: 14th Annual Report.*

♦ ♦

Iowa's New Health Commissioner

Walter L. Bierring, a former member and president of the Iowa State Board of Medical Examiners, for many years secretary-treasurer of the Federation of State Medical Boards, and a member of the National Board of Medical Examiners, was recently appointed state health commissioner. He will enter on his new duties July 1, 1933.

Deaths

Alfred Henry, associate professor of medicine in Indiana University School of Medicine, died of heart disease, aged 58.

♦ ♦

George H. Noble, emeritus professor of clinical gynecology in Emory University School of Medicine, died, aged 72.

♦ ♦

Percy W. Toombs, professor of obstetrics University of Tennessee College of Medicine, died of heart disease, aged 52.

♦ ♦

George Fetterolf, professor of otolaryngology in the School of Medicine of the University of Pennsylvania, died of cerebral thrombosis, aged 63.

♦ ♦

Edward N. Brush, emeritus professor of psychiatry University of Maryland School of Medicine, died of pneumonia, aged 80.

William A. La Field, clinical professor of radiology, Yale University Medical School, aged 51, died of illuminating gas poisoning, probably self administered.

♦ ♦

William P. Graves, for many years professor of gynecology in Harvard Medical School, died in January of pneumonia, aged 63.

♦ ♦

Clarence J. McCusker, clinical professor of obstetrics and head of the department in the University of Oregon School of Medicine, died of nephritis, aged 58.

♦ ♦

Gayfree Ellison, professor of epidemiology and public health in the University of Oklahoma School of Medicine, died, aged 57.

Book Reviews

Internal Medicine: Its Theory and Practice

In contribution by American authors. Edited by John H. Musser, professor of medicine in the Tulane University of Louisiana School of Medicine. Lea & Febiger, Philadelphia. 1932. Price, \$10.

This book is the work of twenty-seven recognized authorities, each of whom holds a professorial appointment in a prominent medical school. Each covers that subdivision of internal medicine in which he is particularly qualified; each writes from the viewpoint of his experience as a teacher and presents his specialized knowledge in such a way as to make this work an authoritative source of information for the student or for the practicing physician who desires to review the subject or to acquire the latest conceptions of disease.

Most of the chapters open with a discussion of the general features common to a group of diseases, covering their incidence, their pathologic physiology and similar data before passing to the detailed discussion of the more common diseases. Throughout, bibliographies give the important original sources. This book provides that mastery of the theory and practice of internal medicine which, because of its increasing complexities and the steadily mounting mass of facts, usually escapes the busy practitioner. The work is well organized, absolutely authoritative, and will be found to be increasingly useful as a source of ready reference, covering the latest and most important knowledge in this field.

The book is divided into four parts: Part I.—The Infectious Diseases. Part II.—Systemic Diseases. Part III.—Diseases of Nutrition, Allergy, Metabolism,

Physical and Chemical Agents. Part IV.—Diseases of the Nervous System.

The bibliographic references appended to many of the chapters will be appreciated by those who wish to delve deeper because while not numerous they have been selected with great care, hence have real value. * *

Obstetric Education

A publication of the White House Conference on Child Health and Protection. The Century Company, New York, 1932. Price, \$3.00.

The findings of the Subcommittee on Obstetric Teaching and Education of the Committee on Prenatal Care are discussed in this volume, and recommendations are offered to improve obstetric practice and to lower the present high maternity death-rate in the United States. Conscious that the high maternal mortality rate is a reflection on the training and education of those who are charged with furnishing maternity care, the Subcommittee made an appraisal of: the training of physicians for obstetric practice, including undergraduate training and subsequent or graduate education, the obstetric education of nurses and nursing attendants; the history, status abroad and status in this country, education, and training of mid-wives; and the obstetric education of the laity and of social workers. The Subcommittee advocates more adequate professional training and points out the necessity of securing the recognition and support of the laity without which no comprehensive plan for maternal care will function properly.

For the purposes of this study, the Subcommittee on Obstetric Teaching and Education formed itself into various sub-

divisions under the chairmanship of Fred Lyman Adair, M. D. The undergraduate education of physicians was studied under the chairmanship of Palmer Findley, M. D.; graduate education of physicians, Rudolph W. Holmes, M. D., chairman; obstetric education of nurses and nursing attendants, George W. Kosmak, M. D., chairman; obstetric education of midwives, James Robert McCord, M. D., chairman; obstetric education of the laity and social workers, Robert L. De Normandie, M. D., chairman.

♦ ♦

Pediatrics

Education and Practice

A publication of White House Conference on Child Health and Protection.

Report of the Committee on Medical Education. The Century Co., New York. 1932. Price, \$1.50.

The work of the Subcommittee centered upon three principal projects: a study of the practice of the physician in the field, and of his opinion as to the adequacy or inadequacy of his medical school training in pediatrics; a study of the position pediatrics occupies in the medical school program, the hours allotted to it, subjects taught, and facilities available; and a study of the demands and needs of postgraduate instruction and the opportunities available.

The first part of the book presents in detail statistical studies bearing on the pediatric education of physicians, undergraduate instruction, and postgraduate instruction, and also an outline of pediatric courses. The second part is devoted to a general discussion of the findings and to the specific recommendations of the Subcommittee.

♦ ♦

Psychology and Psychiatry in Pediatrics: The Problem

Report of the Subcommittee on Psychology and Psychiatry of the White

House Conference on Child Health and Protection. The Century Co., New York. 1932. Price, \$1.50.

This report considers the important question, "Should the medical practitioner attempt to give advice when difficulties threaten the satisfactory development of personality in a child under his care?"

Although the report does not urge all doctors to attempt to become expert in the fields of psychology and psychiatry, it states the opinion that adequate physical care of the child cannot be given without attention to whatever intellectual and emotional difficulties may be present, and concludes that when trouble arises and the individual child is in distress a well-informed and alert physician is the obvious adviser. "Unwillingness of doctors at large to acquire the ability to deal wisely with problems involving personality of the child," says the report, "may lead to transfer of this field to formal organizations or to individuals without medical experience. Such a solution will inevitably diminish both prestige of the private practitioner of medicine and the interest of his job."

♦ ♦

Body Mechanics:

Education and Practice

Report of the Subcommittee on Orthopedics and Body Mechanics of the White House Conference on Child Health and Protection. The Century Co., New York. 1932. Price, \$1.50.

This is a report of a searching investigation made into the relation of body mechanics and posture to the health and wellbeing of children. Body mechanics is defined as "the mechanical correlation of the various systems of the body with special reference to the skeletal, muscular, and visceral systems."

"There is positive evidence," the report says, "to prove that not less than two-thirds of the young children of the United States exhibit faulty body me-

chanics," and that this condition is likely to continue into adult life. The evidence gathered shows that improvement in body mechanics is associated with improvement in health and efficiency.

An important distinction is made in the report between training in the principles of good body mechanics and training in various physical exercises.

The detailed recommendations and the suggested program of corrective exercises presented here will be of value to all those concerned with the care and training of children.

♦ ♦

Diseases of the Spinal Cord

By Williams B. Cadwalader, professor of clinical neurology, University of Pennsylvania School of Medicine. The Williams & Wilkins Company, Baltimore. 1932. Price, \$5.

This book treats of and describes the different aspects of the diseases that affect the spinal cord. The subjects are presented in a concise comprehensive manner, yet with due regard to thoroughness and in a form that appeals especially to medical students. Chapters I and II present brief reviews of the neuron theory and descriptions of the effects of degeneration, as well as an outline of the anatomy of the spinal cord and of the arrangement of the conducting pathways. In Chapter III the reflexes and reflex action are considered from the viewpoint of physiology, and an attempt is made to correlate these conceptions so as to permit ready application to the interpreta-

tion of phenomena developing during the course of disease. Chapters IV and V are devoted to a discussion of the symptoms occurring in the presence of lesions involving tracts of known function. The remaining chapters (10) treat of spinal cord disorders, each disease being described separately. An appended bibliography giving 328 references is a valuable addition to the book.

♦ ♦

Communicable Disease Control

Report of the Committee on Communicable Disease Control of the White House Conference on Child Health and Protection. The Century Co., New York. 1932. Price, \$2.25.

This report points out the importance of the control of communicable diseases among children; reviews the current control practices; recommends those practices which experience has indicated to be most effective; and suggests fields in which further study is most urgently needed. The report is the fruit of an extensive study made by a large number of qualified experts and is probably the most up-to-date and authoritative survey of the subject available. The section on suggested procedures for the control of communicable diseases has been carefully considered by the entire Committee as well as by other authorities to whom it was submitted in advance of publication, and it is believed that it contains the most dependable information obtainable on the control of the different diseases.

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